ORIGINAL NEW APPLICATION

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BEFORE THE ARIZONA CORPORATIO

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E-04204A-11-0056

IN THE MATTER OF THE APPLICATION OF UNS ELECTRIC, INC. FOR APPROVAL OF ITS 2011-2012 ENERGY EFFICIENCY IMPLEMENTATION PLAN.

DOCKET NO. E-04204A-11-____

APPLICATION

(Expedited Review and Approval Requested by June 1, 2011)

UNS Electric, Inc. ("UNS Electric" or "Company"), through undersigned counsel, and in accordance with Arizona Administrative Code R14-2-2405 and the Arizona Corporation Commission's Policy Statement of Regarding Utility Disincentive to Energy Efficiency and Decoupled Rate Structures (the "Commission's Policy Statement"), hereby submits for Arizona Corporation Commission ("Commission") approval of its:

(i) Energy Efficiency Implementation Plan for 2011-2012 ("EE Plan"); and

(ii) UNS Electric's proposed Demand-Side Management ("DSM") Surcharge ("DSMS").

Arizona Corporation Commission
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In support hereof, UNS Electric states as follows:

I. INTRODUCTION.

UNS Electric's EE Plan describes how the Company intends to meet the 2011 Energy Efficiency Standard ("EE Standard") target for 2011 of 1.25% and the cumulative EE Standard target for 2012 of 3%, as well as an estimate of the annual kilowatt hour ("kWh") and kilowatt ("kW") savings projected for each program through 2012. UNS Electric's EE Plan also sets forth the Company's existing and proposed DSM programs, their estimated total cost and cost per kWh reduction, and how those programs comply with the requirements of the EE Standard. Finally, the EE Plan includes a tariff filing that complies with A.A.C. R14-2-2406(A) and includes a request to

modify and reset the existing adjustment mechanism for implementation through 2012 in order to ensure just and reasonable rates.

To implement the EE Plan, UNS Electric estimates an EE Plan Budget total of approximately $16 million.[1] At this time, it is anticipated that the DSMS required to implement the EE Plan will be approximately $0.003350/kWh, based on forecasted retail sales for the same 19 months. The average impact to a residential customer will be $2.81 per month.

II. THE EE PLAN.

In this application, UNS Electric respectfully requests that the Commission approve its EE Plan. Key provisions of the EE Plan are summarized as follows:

A. Approval and implementation of the proposed EE Plan and DSM Surcharge as of June 1, 2011.

A.A.C R14-2-2405(A) requires UNS Electric to file its initial EE Plan within 30 days of the effective date of the EE Standard. A.A.C. R14-2-2405(A) also requires that subsequent plans be filed on June 1 of each odd year, making UNS Electric's next EE Plan due June 1, 2013. The EE Plan is a 2 year implementation plan. UNS Electric believes that a 2 year plan provides a better time frame for the Commission to evaluate the impact of the EE Standard and its results.

UNS Electric also requests that the DSMS be implemented by June 1, 2011 so that the Company can continue its effective implementation of the EE Standard. This expedited review and implementation of the DSMS will ensure no gaps in implementation or program delivery between the previously approved DSM Plan and the newly filed EE Plan, which is critical to the Company's recovery of program costs and is in the best interest of rate payers.

B. Conforming existing reporting requirements in light of the reporting requirements contained in the EE Standard.

Pursuant to A.A.C. R14-2-2409(D), UNS Electric requests that the reporting requirements in the EE Standard be found to be in compliance with the Company's existing reporting

[1] The Company's proposed DSMS is explained more fully in Exhibit 3 attached hereto and incorporated herein

requirements in Decision No. 70360 (May 27, 2008). Currently, UNS Electric is required to file its DSM surcharge on April 1st and its semi-annual DSM reports on April 1st and October 1st of each year. The reporting requirements contained in R14-2-2409 require that certain DSM reports be filed March 1st and September 1st respectively. In order to avoid confusion or duplicative filings, UNS Electric requests that the reporting requirements set forth in A.A.C. R14-2-2409 be used and that the Commission find that the use of such reporting requirements by UNS Electric in making its filings is in compliance with Decision No. 70360.

C. New DSM programs.

UNS Electric is proposing the following new Residential, Commercial, Behavioral and Support DSM Programs: Multi-Family, Appliance Recycling, Schools Program, Retro-Commissioning, Bid-for-Efficiency, Behavioral Comprehensive (including Home Energy Reports, K-12 education, direct canvassing, compact fluorescent bulb give away, and community education), Residential Financing, and Codes and Support.[2]

D. Enhancements to existing DSM programs.

The EE Plan incorporates enhancements through modifications to the following existing DSM programs: Efficient Products (formerly CFL Buy-Down) and C&I Facilities. UNS Electric is also proposing to modify its existing Low-Income Weatherization Program by modifying customer eligibility requirements to match the current Low-Income Home Energy Assistance Program ("LIHEAP") standard of Federal Poverty Level. The modifications to these programs are set forth in the EE Plan attached hereto. The Company plans to continue administering the following existing programs with no modifications: Residential New Construction, Shade Tree, Existing Homes/Audit Direct Install, and Education and Outreach.

E. The proposed DSMS.

UNS Electric is seeking approval of the proposed DSMS to recover two elements: (i) DSM program costs; and (ii) DSM performance incentives.

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[2] The New DSM programs are set forth in detail in the Appendices attached hereto and incorporated herein.

(i) DSM Program Costs and Under Collection.

Pursuant to A.A.C. R14-2-2410(A), a utility may recover the costs that it incurs in planning, designing, implementing, and evaluating a DSM program or measure. UNS Electric is requesting approval to collect $13.8 million in DSM program costs.

(ii) DSM Performance Incentive.

As described in A.A.C. R14-2-2411, the EE Standard allows a utility to propose a performance incentive to assist in achieving the energy efficiency standard. Proposal of this incentive can occur outside of a rate case. UNS Electric is proposing a $2.2 million pre-tax DSM performance incentive for 2011-2012. In implementing this incentive, UNS Electric proposes to continue using the previously Commission-approved shared incentives ("net" benefit based on the societal cost test) with a modification to performance incentive structure. Specifically, the Company proposes to reduce the percent-share of net-saving and place a hard dollar cap based on 10% of net benefits rather than on a percent of spending. Details are shown in the following table.

Achievement of EE Goals	% of Lifetime Net Benefits
<85%	5%
85% - 95%	6%
96% - 105%	7%
106% - 115%	8%
116% - 125%	9%
>125%	10% (cap below)
Dollar Cap (2011 and 2012)	$1,920,515

F. Procedural and Administrative Modifications.

In order to sustain participation in EE programs, the EE Plan contemplates flexibility for the Company to shift approved funds between programs, and modify budget line items, where cost-effective. This type of flexibility has proven to be valuable in the implementation plans of the Renewable Energy Standard. UNS Electric is requesting that the following language be

adopted in order approving the EE Plan:

> *"Accordingly, UNS Electric will be allowed to shift up to 25% of approved funds from Residential to Commercial or from Commercial to Residential programs as deemed necessary and cost-effective based on program activity, and UNS Electric will be allowed the option of increasing up to 25% of the total Energy Efficiency budget where cost-effective to continue participation until approval of the next regularly scheduled Energy Efficiency Implementation plan."*

In addition, UNS Electric would agree to evaluate program progress and requirements to shift funds from one program to another and to provide updates to the Commission at any interval requested by the Commission.

III. CONCLUSION.

UNS Electric's EE Plan contains new programs, enhancements to existing programs, and continued implementation of already successful programs. The EE Plan is designed to comply with the Commission's EE Rules and to provide a framework for future compliance. Accordingly, for all the forgoing reasons, UNS Electric respectfully requests that the Commission issue an order in this case:

1. Approving the EE Plan;
2. Finding that compliance with the reporting requirements set forth in A.A.C. R14-2-2409 should be used and are in compliance with the requirements of Decision No. 70360 (May 27, 2008);
3. Approving the DSMS;
4. Approving the proposed performance incentives;
5. Setting the effective date of the EE Plan and DSMS as of June 1, 2011; and
6. For and such other relief as the Commission deems appropriate and in the public interest at this time.

RESPECTFULLY SUBMITTED this 31st day of January 2011.

UNS Electric, Inc.

By _____

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By Mary Ippolito

UNS ELECTRIC, INC.
2011-2012
ELECTRIC ENERGY EFFICIENCY IMPLEMENTATION PLAN

JANUARY 31, 2010

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I. 2011-2012 Implementation Plan Executive Summary

UNS Electric, Inc. ("UNS Electric" or "Company") is pleased to present its 2011-2012 Energy Efficiency Implementation Plan ("EE Plan") for Arizona Corporation Commission ("Commission") approval, in compliance with Arizona Administrative Code R14-2-2405. As part of its EE Plan, UNS Electric has included a description of how the Company intends to meet the 2011 Electric Energy Efficiency Standard ("EE Standard" or "EEES") of 1.25% and the cumulative 2012 EE standard of 3.0%, as well as an estimate of the annual kilowatt hour ("kWh") and kilowatt ("kW") savings projected for each program through 2012.

UNS Electric's EE Plan also contains a description of existing and proposed Demand-Side Management ("DSM") programs, their estimated total cost and cost per kWh reduction, and how those programs contribute to the Company's 2011-2012 EE savings goals. UNS Electric has included a tariff filing that complies with A.A.C. R14-2-2406(A) and a request to modify and reset the existing adjustment mechanism for implementation through 2012 in order to ensure just and reasonable rates.

UNS Electric estimates a 2011-2012 EE Plan Budget Total of approximately $16 million. Additional details and the elements of the Company's proposed Demand-Side Management Surcharge ("DSMS") for June 1, 2011 through December 31, 2012 can be found in the attached Exhibit 3. At this time, it is anticipated that the total DSMS required to implement the 2011-2012 EE Plan will be approximately $0.003350/kWh based on forecasted retail sales for the same 19 months. The average impact to a residential customer from the total DSMS for 2011-2012 will be $2.81 per month. Budget details as well as a summary of portfolio savings, net benefits, and benefit-cost results appear in Table 1-1.

Table I-1. Summary Costs and Savings

Program Year	Total Program Budget	Annual Savings (MWh)	Lifetime Savings (MWh)	Peak Demand Savings (MW)	Total Net Benefits	Portfolio Societal Cost Test
2011	$5,828,873	31,436	224,013	4.79	$6,169,870	2.1
2012	$7,939,196	41,696	328,186	6.64	$8,973,240	2.2
Total	$13,768,070	73,132	552,199	11.43	$15,143,109	2.2

As part of UNS Electric's EE Plan, the Company is seeking approval of the following new Residential, Commercial, Behavioral and Support Programs: Multi-Family, Appliance Recycling, Schools Program, Retro-Commissioning, Bid-for-Efficiency, Behavioral Comprehensive (including Home Energy Reports, K-12 Education, Direct Canvassing, Compact Fluorescent ("CFL") Bulb Give Away, and Community Education), Residential Financing, and Codes and Support. The full details of each program, including each program's budget, can be found in the attached appendices.

UNS Electric is also seeking enhancements through the addition of new measures to the following existing DSM programs (full details and budgets appear in the attached appendices): Efficient Products (formerly CFL Buy-Down), and C&I Facilities. UNS Electric is proposing to modify its existing Low-Income Weatherization Program by modifying customer eligibility requirements to match the current Low-Income Home Energy Assistance Program ("LIHEAP") standard of Federal Poverty Level.

UNS Electric plans to continue administering the following existing programs with no modifications: Residential New Construction, Shade Tree, Existing Homes and Audit Direct Install, and Education and Outreach. UNS Electric's proposed portfolio of new and expanded programs is projected to meet the

2011 goal of 1.25% previous year retail sales and the 2012 cumulative goal of 3%. Program planning also accounts for delays in program approval and start-up.

In addition to programmatic changes, UNS Electric is seeking approval of its proposed DSM Surcharge to recover two elements: (i) DSM program costs; and (ii) after tax DSM performance incentives. Specifically, UNS Electric is requesting approval to collect $16 million, $13.8 million in DSM program costs and $2.2 million in a pre-tax DSM performance incentive for 2011-2012. UNS Electric is also seeking approval to shift approved EE Plan funds between programs, and to moderately increase the budgets outlined in the 2011-2012 EE Plan where cost-effective.

As explained in the attached EE Plan and appendices, UNSE's 2011-2012 EE Plan contains new programs, enhancements to existing programs, and continued implementation of already successful programs. UNS Electric respectfully requests approval of these programs and their budgets as well as implementation of the proposed DSMS by June 1, 2011. UNS Electric believes these measures are prudent and necessary to the successful implementation of the EEE Standard and are in the public interest.

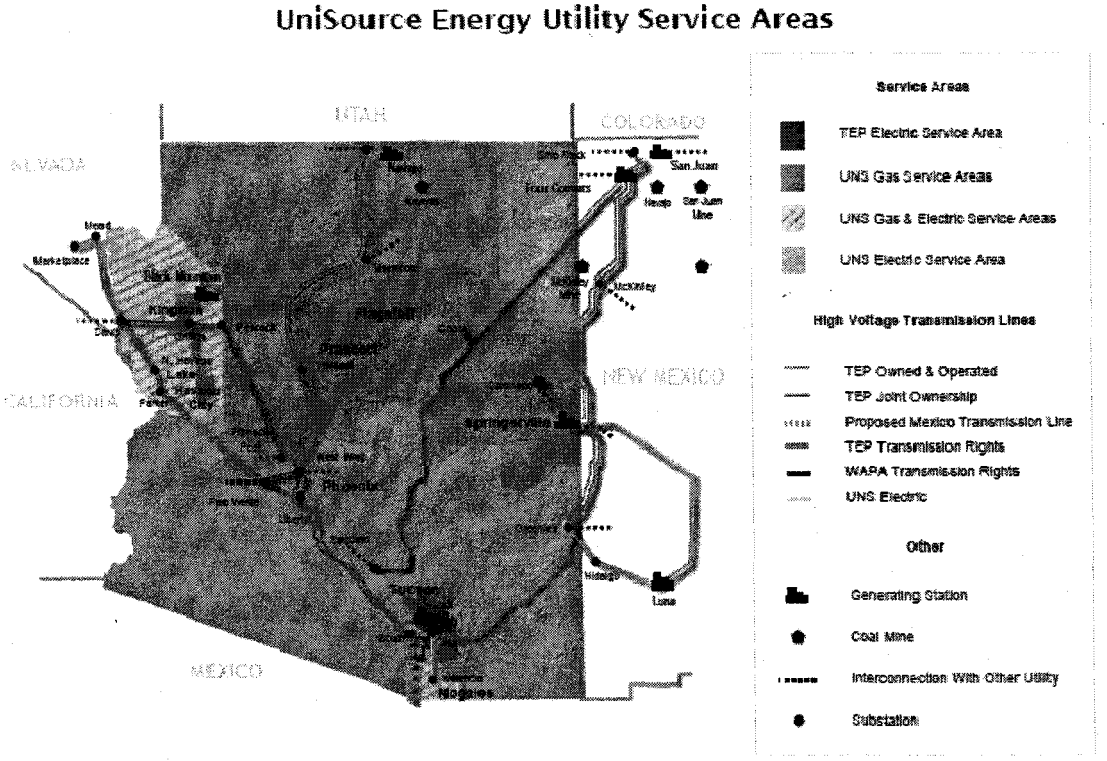
II. Introduction

The following EE Plan presents a detailed overview of the proposed electric energy efficiency programs targeted at the residential, commercial and industrial ("C&I") sectors, as well as their associated implementation costs, savings, and benefit-cost results. The EE Plan presents detailed information on the approach, energy efficiency measures, and proposed incentive levels.

UNS Electric, with input from other parties such as the Southwest Energy Efficiency Project ("SWEEP") has designed a comprehensive portfolio of programs to deliver electric energy and demand savings to meet the annual EE savings goals outlined in the EE Standard. These programs include incentives, direct-install and buy down approaches for energy efficient products and services, educational and marketing approaches to raise awareness and modify behaviors, and partnerships with trade allies to apply as much leverage as possible to augment the rate-payer dollars invested.

For context and reference, service territory graphics are included below. Figure 2-1 shows UNS Electric service territory in the context of all Unisource Energy Corporation service territories.

Figure 2-1. Unisource Energy Service Territory



A. Implementation Plan, Goals, and Objectives

UNS Electric's high-level efficiency-related goals and objectives for the 2011-2012 EEES are as follows:

- Implement only cost-effective energy efficiency programs.
- Design and implement a diverse group of programs that provide opportunities for participation for all customers.
- Achieve a 2011 energy savings goal equal to 1.25% of 2010 retail sales and achieve a 2012 energy savings goal equal to 1.75% of 2011 retail sales.
- When feasible, maximize opportunities for program coordination with other efficiency programs (e.g., Southwest Gas Corporation, Arizona Public Service Company) to yield maximum benefits.
- Maximize program savings at a minimum cost by striving to achieve comprehensive cost-effective savings opportunities.
- Provide UNS Electric customers and contractors with web access to detailed information on all efficiency programs (residential and business) for electricity savings opportunities at www.uesaz.com.
- Expand the energy efficiency infrastructure in the state by increasing the number of available qualified contractors through training and certification in specific fields.
- Use trained and qualified trade allies such as electricians, HVAC contractors, builders, architects and engineers to transform the market for efficient technologies.
- Inform and educate customers to modify behaviors that enable them to use energy more efficiently.

B. Planning Process

UNS Electric's portfolio of programs incorporates elements of the most successful energy efficiency programs across North America into program plans designed for UNS Electric customers in particular. A substantial amount of information including evaluations, program plans and potential studies were used to develop specific programs for UNS Electric. UNS Electric also used a benchmarking process to review the most successful energy efficiency programs from across the country, with a focus on successful Southwest programs to help shape the portfolio.

C. Portfolio Risk Management

As of December 2010, the Arizona economy remains in the midst of recovering from a severe economic recession. In this economic environment, UNS Electric's ability to convince residential and business customers to voluntarily take on additional debt for the installation of cost-effective measures, even with very short pay-back periods, will likely be challenging. UNS Electric recognizes this challenge and has developed a portfolio of programs that provides opportunities for participation at multiple levels. By proposing a multi-faceted and broad portfolio of programs that offers something for all ratepayers, UNS Electric will attempt to capitalize on those sectors of the market willing to invest in energy efficiency, regardless of the challenging economic landscape. In balance, this will allow us to meet aggressive regulatory efficiency goals.

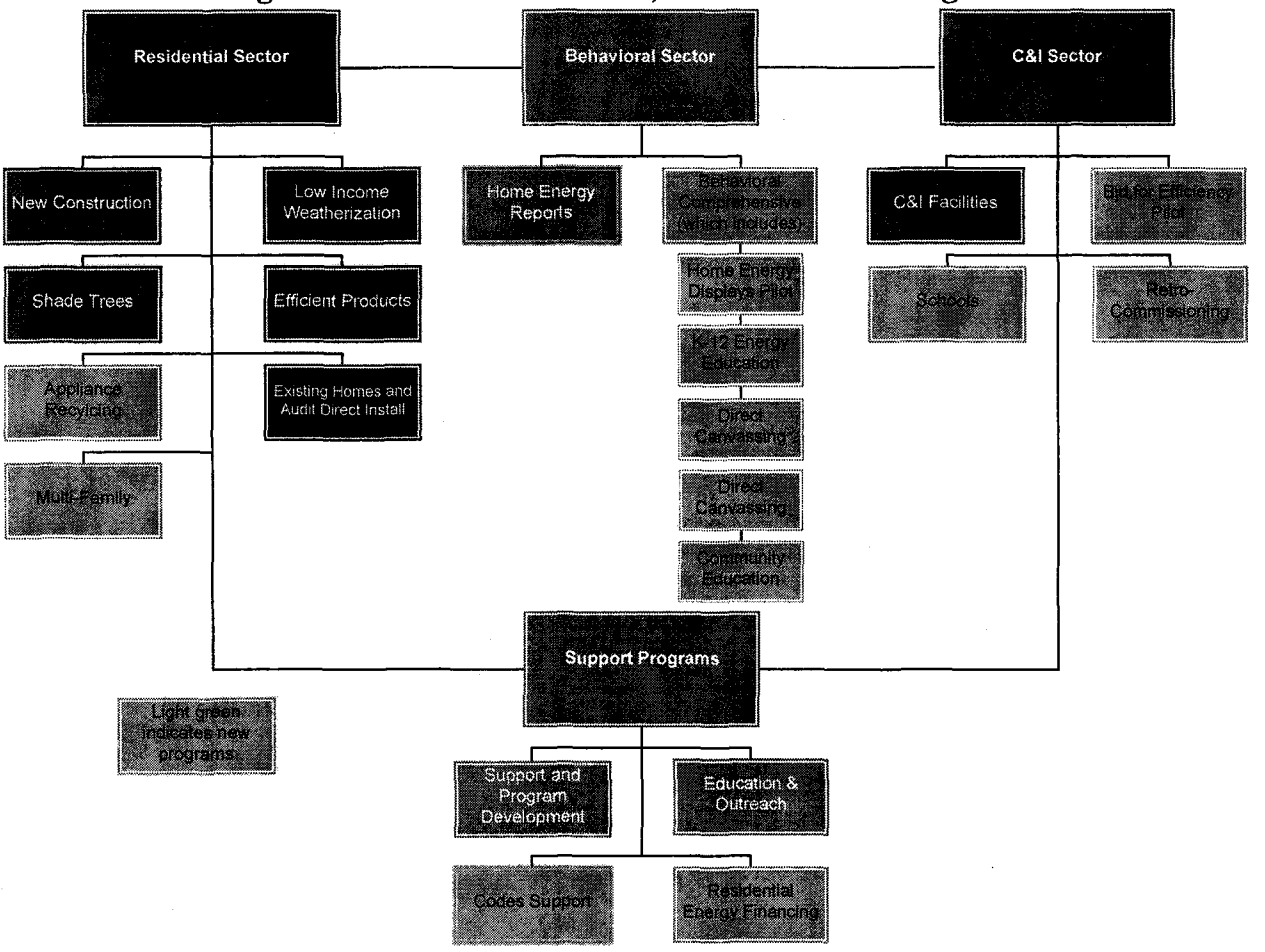
UNS Electric used the following strategies to minimize the risks and produce the lowest cost associated with its portfolio of energy efficiency programs.

- Implemented primarily "tried and true" programs that have been successfully applied by other utilities in the Southwest and across the country.
- Implemented programs through a combination of third-party implementation contractors and utility staff. UNS Electric designs programs on the most cost-effective basis utilizing Implementation Contractor where they provide the lowest cost per kWh and likewise utilizing UNS Electric staff when appropriate.

III. Program Portfolio Overview

As demonstrated in Figure 3-1, UNS Electric's portfolio of programs can be divided into residential, commercial, behavioral, and support sectors with administrative functions providing support across all program areas. Detailed information on existing program design, measure savings, costs and other technical details are available in Section V through Section X and detailed information for all new programs are included in the appendices.

Figure 3-1. Unisource Electric, Inc. Portfolio of Programs



A. Savings, Budgets, Benefit Cost Results Overview

While this plan presents a two-year portfolio of investment consistent with the requirements of the EE Standard, UNS Electric will continue to monitor projected program funding and participation. As such, we expect there may be some slight adjustments in the forecasted investment levels. Additionally, incentive levels and other program elements will be reviewed and modified on an annual basis to reflect changes in market conditions or implementation processes in order to maximize cost-effective savings. Such modifications will be reported in the annual reports submitted to the Commission.

As detailed in Table 3-13-1 through Table 3-43-4, UNS Electric developed this plan with the intent to meet statutory electric savings goals as a percent of prior year sales as outlined in the Electric Energy Efficiency Standard Section R14-2-2404. For 2011, UNS Electric's budget forecast is $5.8 million increasing to $7.9 million in 2012.

Table 3-1. Summary of Costs and Savings

Program Year	Total Program Budget	Annual Savings (MWh)	Lifetime Savings (MWh)	Peak Demand Savings (MW)	Total Net Benefits	Portfolio Societal Cost Test
2011	$5,828,873	31,436	224,013	4.79	$6,169,870	2.1
2012	$7,939,196	41,696	328,186	6.64	$8,973,240	2.2
Total	$13,768,070	73,132	552,199	11.43	$15,143,109	2.2

As noted in Table 3-2, the 2011 EEES target is 1.25% savings as percent of sales of the previous calendar year; for 2012 this increases to a cumulative goal of 3.0%. UNS Electric's proposed portfolio of new and expanded programs is projected to meet the 2011 and the 2012 goal. UNS Electric believes it is prudent to factor project fall-out and delay in approval to achieve the EEES goals. This approach will show the Company overachieving the EEES, but as inevitabilities take place, the Company expects to meet the EE Standard for both 2011 and 2012.

Table 3-2. Planned Savings and EEES Target

	2011	2012
Annual MWh Savings Goal as % of S	1.25%	1.75%
MWh Savings Goal	23,432	33,816
Planned MWh Savings	31,436	41,696
Planned MWh Savings as % of Sales	1.68%	2.16%
Percent of Savings Goal Achieved	134%	123%

Note: MWh Savings include line loss reductions created from energy reductions which are not included in the Authorized Revenue Requirement True-up.

Table 3-3 provides cost and savings details per program over 2011 and 2012 period combined. Given that the current behavior programs all benefit residential customers, the break down in spending between residential and commercial is even and in line with revenues.

Table 3-3. 2011-2012 Costs and Savings by Program

		2011-2012 Total					
		Annual Savings (MWh)	Peak Demand Savings (MW)	Total Program Cost	Percent of Annual Savings (MWh)	Percent of Peak Demand Savings (MW)	Percent of Total Portfolio Cost
Residential	Efficient Products	17,184	1.97	$1,324,393	23%	17%	10%
	Appliance Recycling	3,079	0.35	$450,260	4%	3%	3%
	Res. New Construction	789	0.44	$770,538	1%	4%	6%
	Existing Homes and Audit Direct Inst	2,591	1.57	$2,710,969	4%	14%	20%
	Shade Tree	320	0.05	$108,398	0%	0%	1%
	Low Income Weatherization	266	0.03	$703,251	0%	0%	5%
	Multi-Family	820	0.04	$81,300	1%	0%	1%
	Subtotal	25,048	4.45	$6,149,108	34%	39%	45%
Commercial	C&I Facilities	17,413	3.95	$3,556,314	24%	35%	26%
	Bid for Efficiency - Pilot	2,652	0.24	$470,670	4%	2%	3%
	Retro-Commissioning	1,989	0.18	$256,352	3%	2%	2%
	Schools Facilities	1,933	0.18	$359,047	3%	2%	3%
	Subtotal	23,987	4.55	$4,642,384	33%	40%	34%
Behavior	Home Energy Reports	14,503	1.32	$522,082	20%	12%	4%
	Behavioral Comprehensive Program	9,594	1.10	$828,399	13%	10%	6%
	Subtotal	24,097	2.42	$1,350,481	33%	21%	10%
Support Programs	Education and Outreach	-	-	$283,706	0%	0%	2%
	Residential Energy Financing	-	-	$852,459	0%	0%	6%
	Codes Support	-	-	$51,452	0%	0%	0%
	Program Development, Analysis and Reporting Software	-	-	$438,480	0%	0%	3%
	Subtotal	-	-	$1,626,096	0%	0%	12%
Total	Total	73,132	11.43	$13,768,070			

Table 3-4 provides program level detail of budgetary break downs as well as program and portfolio level cost effectiveness results.

Table 3-4. 2011 and 2012 Program Budgets, Net Benefits, and Cost Effectiveness

		2011-2012 Total		
		Total Program Cost	Lifetime Net Benefits ($)	Program Level Societal Cost Test
Residential	Efficient Products	$1,324,393	$4,465,427	3.9
	Appliance Recycling	$450,260	$435,296	1.7
	Res. New Construction	$770,538	$793,389	1.6
	Existing Homes and Audit Direct Inst	$2,710,969	$231,602	1.1
	Shade Tree	$108,398	$178,682	1.8
	Low Income Weatherization	$703,251	$20,917	1.0
	Multi-Family	$81,300	$235,199	3.9
	Subtotal	$6,149,108	$6,360,511	1.8
Commercial	C&I Facilities	$3,556,314	$5,134,805	2.9
	Bid for Efficiency - Pilot	$470,670	$679,924	2.7
	Retro-Commissioning	$256,352	$630,594	3.7
	Schools Facilities	$359,047	$646,235	3.7
	Subtotal	$4,642,384	$7,091,558	3.0
Behavior	Home Energy Reports	$522,082	$188,574	1.4
	Behavioral Comprehensive Program	$828,399	$2,448,146	4.0
	Subtotal	$1,350,481	$2,129,520	2.9
Support Programs	Education and Outreach*	$283,706	$0	N/A
	Residential Energy Financing*	$852,459	$0	N/A
	Codes Support*	$51,452	$0	N/A
	Program Development, Analysis and Reporting Software	$438,480	-$438,480	N/A
	Subtotal	$1,626,096	-$438,480	N/A
Total	Total	$13,768,070	$15,143,109	2.2

B. 2011 Portfolio Results

This section presents a detailed review of the 2011 projected savings and costs. UNSE's proposed portfolio of new and expanded programs is projected to meet the 2011 goal of 1.25% of previous year retail sales. As mentioned above, prudent program planning accounts for delays in program approval and start-up.

Table 3-5. 2011 Savings Goal

	2010 Electricity Sales (MWh)	Percent Savings	Program Savings (MWh)
Target	1,874,566	1.25%	23,432
2011 Savings Forecast		1.68%	31,436
Difference		0.43%	8,004
Percent of Target Reached			134%

Table 3-6 presents a detailed review of 2011 portfolio savings, costs, and detail in terms of program level costs per first year and lifetime energy and demand savings.

Table 3-6. 2011 Annual and Lifetime Portfolio Savings and Costs

		2011							
		Annual Energy Savings at Generator (MWh)	Coincident Demand Savings at Generator (MW)	Total Program Budget	Cost per Lifetime kWh Saved ($/kWh)	Cost per First Year kWh Saved ($/kWh)	Cost per kW Saved ($/kW)	Percent of MWh Savings by Program	Percent of Budget by Program
Residential	Efficient Products	8,679	0.99	$558,208	$0.01	$0.06	$564	28%	10%
	Appliance Recycling	1,540	0.18	$225,011	$0.02	$0.15	$1,280	5%	4%
	Res. New Construction	329	0.19	$359,084	$0.04	$1.09	$1,937	1%	6%
	Existing Homes and Audit Direct Instal	1,047	0.63	$1,156,567	$0.07	$1.10	$1,848	3%	20%
	Shade Tree	133	0.02	$47,965	$0.02	$0.36	$2,245	0%	1%
	Low Income Weatherization	133	0.01	$351,433	$0.13	$2.64	$26,592	0%	6%
	Multi-Family	0	0.00	$0	$0.00	$0.00	N/A	0%	0%
	Subtotal	11,861	2.01	$2,698,269	$0.029	$0.23	$1,341	38%	46%
Commercial	C&I Facilities	6,807	1.49	$1,497,435	$0.02	$0.22	$1,002	22%	26%
	Bid for Efficiency - Pilot	884	0.08	$147,087	$0.02	$0.17	$1,822	3%	3%
	Retro-Commissioning	0	0.00	$0	$0.00	$0.00	N/A	0%	0%
	Schools Facilities	611	0.06	$161,402	$0.02	$0.26	$2,894	2%	3%
	Subtotal	8,302	1.63	$1,805,924	$0.019	$0.22	$1,107	26%	31%
Behavior	Home Energy Reports	6,215	0.57	$209,150	$0.03	$0.03	$368	20%	4%
	Behavioral Comprehensive Program	5,058	0.58	$309,683	$0.01	$0.06	$536	16%	5%
	Subtotal	11,274	1.15	$518,832	$0.014	$0.05	$453	36%	9%
Support Programs	Education and Outreach	0	0.00	$141,822	N/A	N/A	N/A	0%	2%
	Residental Energy Financing	0	0.00	$425,853	N/A	N/A	N/A	0%	7%
	Codes Support	0	0.00	$22,174	N/A	N/A	N/A	0%	0%
	Program Development, Analysis and Reporting Software	0	0.00	$216,000	N/A	N/A	N/A	0%	4%
	Subtotal	0	0.00	$805,848	N/A	N/A	N/A	0%	14%
Total	Total	31,436	4.79	$5,828,873	$0.026	$0.19	$1,217	100%	100%

Table 3-7 presents 2011 portfolio costs, by program, segmented by the amount projected to be spent on incentives, program delivery, program marketing, utility program administration, and evaluation and program development, analysis and reporting software costs.

Table 3-7. 2011 Summary Portfolio Implementation Costs

		2011							
		Incentives	Program Delivery	Program Marketing	Utility Program Administration	Evaluation	Total Cost/Budget	Lifetime Net Benefits ($)	Societal Cost Test (Program Level)
Residential	Efficient Products	$241,500	$220,887	$69,358	$10,204	$16,258	$558,208	$2,265,191	4.9
	Appliance Recycling	$40,250	$153,787	$19,404	$2,915	$8,654	$225,011	$217,767	1.7
	Res. New Construction	$88,000	$209,703	$44,655	$2,915	$13,811	$359,084	$292,552	1.5
	Existing Homes and Audit Direct Instal	$664,000	$309,883	$146,082	$2,915	$33,686	$1,156,567	$35,248	1.0
	Shade Tree	$20,000	$21,147	$2,057	$2,915	$1,845	$47,965	$71,652	1.8
	Low Income Weatherization	$324,000	$10,932	$3,349	$2,915	$10,236	$351,433	$10,651	1.0
	Multi-Family	$0	$0	$0	$0	$0	$0	$0	N/A
	Subtotal	$1,377,750	$926,340	$284,906	$24,781	$84,491	$2,698,269	$2,893,061	1.9
Commercial	C&I Facilities	$817,603	$370,725	$237,665	$13,848	$57,594	$1,497,435	$1,876,649	2.7
	Bid for Efficiency - Pilot	$120,000	$1,715	$18,257	$1,458	$5,657	$147,087	$236,444	2.9
	Retro-Commissioning	$0	$0	$0	$0	$0	$0	$0	N/A
	Schools Facilities	$71,234	$60,005	$6,956	$17,000	$6,208	$161,402	$156,245	2.6
	Subtotal	$1,008,837	$432,444	$262,878	$32,306	$69,459	$1,805,924	$2,269,339	2.7
Behavior	Home Energy Reports	$148,500	$36,087	$9,229	$7,289	$8,044	$209,150	$70,303	1.3
	Behavioral Comprehensive Program	$200,250	$89,606	$5,000	$2,915	$11,911	$309,683	$1,417,256	5.6
	Subtotal	$348,750	$125,694	$14,229	$10,204	$19,955	$518,832	$1,223,471	3.7
Support Programs	Education and Outreach*	$0	$132,500	$4,500	$2,041	$2,781	$141,822	$0	N/A
	Residental Energy Financing*	$166,670	$193,865	$52,761	$2,915	$9,642	$425,853	$0	N/A
	Codes Support*	$0	$18,540	$2,781	$0	$853	$22,174	$0	N/A
	Program Development, Analysis and Reporting Software	$0	$216,000	$0	$0	$0	$216,000	-$216,000	N/A
	Subtotal	$166,670	$560,905	$60,042	$4,956	$13,276	$805,848	-$216,000	N/A
Total	Total	$2,902,007	$2,045,383	$622,056	$72,248	$187,180	$5,828,873	$6,169,870	2.1
	Percent of Cost by Category	50%	35%	11%	1%	3%	100%		

* Lifetime Net Benefits are adjusted to $0. Benefits are likely to equal costs; however at this time they are not quantified.

Table 3-8 on the following page presents a detailed explanation of activities represented in each budget category including: incentives; program delivery; program marketing; utility program administration; evaluation; and program development, analysis and reporting software.

Table 3-8. Budget Item Definitions

Incentives	**Costs for approved customer incentives including but not limited to:** • Direct customer incentives; • Agency payments for low-income weatherization program • Agency payments for shade trees; and • Contractor payments for direct-install programs.
Program Delivery	**Costs associated with implementing approved programs including but not limited to:** • Implementation contractor labor, travel and expenses; • Testing equipment and IC Contractor database modifications; • Energy efficiency education and technical assistance; • Engineering analysis to support custom incentives; • Development and distribution of technical consumer educational materials; • Field inspections and testing; • Data entry and validation; • Sales, oversight and management of programs and budgets; • Training, technical assistance and problem resolution; • Travel and expenses; and • Administration, review and recommended modifications.
Program Marketing	**Direct program marketing costs related to marketing programs and increasing DSM consumer awareness as opposed to general consumer education including but not be limited to:** • Agency and internal costs to develop materials; • Production costs for radio, television, or internet ads; • Internal labor costs to develop materials and marketing plan; and • Costs for ad placement and reproduction and mailing.
Utility Program Administration	**Internal costs for management and reporting, including but not limited to:** • Tracking program activity; • Developing ACC DSM and compliance reports; • Preparing data requests; • Avoided costs evaluation; • Request for proposal ("RFP") and contractor selection; • Contractor and contract management; and • Financial monitoring and compliance.
Evaluation	**Costs for Measurement, Evaluation, and Research by an independent contractor including but not limited to:** • Identification of baseline efficiency levels and the market potential; • Process and impact evaluations; • Verification of installed energy efficient measures; • Validation of reported energy savings; and • Research into new and emerging technologies.
Program Development, Analysis and Reporting Software	**Costs for program design, development and resources necessary to meet reporting requirements of the EE Standard:** • Measure and program research and benefit-cost analysis; • Codes and Standards research and analysis; • Education and training on new technologies; • Incremental cost studies; • Program design, development and analysis; • Software for tracking and reporting to remain in compliance with EEES

C. 2012 Portfolio Results

This section presents a detailed review of the 2012 projected savings and costs. UNS Electric's proposed portfolio of new and expanded programs is projected to meet the cumulative 2012 goal of 3.0% of previous year retail sales. Program planning also accounts for delays in program approval and start-up.

Table 3-9. 2012 Savings Goal

	2011 Electricity Sales (MWh)	Percent Savings	Program Savings (MWh)
Target	1,932,361	1.75%	33,816
2012 Savings Forecast		2.16%	41,696
Difference		0.41%	7,879
Percent of Target Reached			123%

Table presents a detailed review of 2012 portfolio savings, costs, and detail in terms of program level costs per first year and lifetime energy and demand savings.

Table 3-10. 2012 Annual and Lifetime Portfolio Savings and Costs

		2012							
		Annual Energy Savings at Generator (MWh)	Coincident Demand Savings at Generator (MW)	Total Program Budget	Cost per Lifetime kWh Saved ($/kWh)	Cost per First Year kWh Saved ($/kWh)	Cost per kW Saved ($/kW)	Percent of MWh Savings by Program	Percent of Budget by Program
Residential	Efficient Products	8,505	0.98	$766,185	$0.01	$0.09	$780	20%	10%
	Appliance Recycling	1,540	0.18	$225,249	$0.02	$0.15	$1,282	4%	3%
	Res. New Construction	460	0.26	$411,454	$0.03	$0.89	$1,586	1%	5%
	Existing Homes and Audit Direct Install	1,544	0.94	$1,554,402	$0.07	$1.01	$1,648	4%	20%
	Shade Tree	186	0.03	$60,433	$0.02	$0.32	$2,021	0%	1%
	Low Income Weatherization	133	0.01	$351,817	$0.13	$2.65	$26,621	0%	4%
	Multi-Family	820	0.04	$81,300	$0.01	$0.10	$2,099	2%	1%
	Subtotal	13,188	2.44	$3,450,840	$0.030	$0.26	$1,413	32%	43%
Commercial	C&I Facilities	10,605	2.46	$2,058,880	$0.02	$0.19	$837	25%	26%
	Bid for Efficiency - Pilot	1,768	0.16	$323,583	$0.02	$0.18	$2,004	4%	4%
	Retro-Commissioning	1,989	0.18	$256,352	$0.01	$0.13	$1,411	5%	3%
	Schools Facilities	1,323	0.12	$197,645	$0.01	$0.15	$1,639	3%	2%
	Subtotal	15,685	2.92	$2,836,460	$0.016	$0.18	$970	38%	36%
Behavior	Home Energy Reports	8,287	0.76	$312,933	$0.04	$0.04	$413	20%	4%
	Behavioral Comprehensive Program	4,536	0.52	$518,716	$0.02	$0.11	$1,003	11%	7%
	Subtotal	12,823	1.27	$831,649	$0.023	$0.06	$653	31%	10%
Support Programs	Education and Outreach	0	0.00	$141,884	N/A	N/A	N/A	0%	2%
	Residental Energy Financing	0	0.00	$426,606	N/A	N/A	N/A	0%	5%
	Codes Support	0	0.00	$29,278	N/A	N/A	N/A	0%	0%
	Program Development, Analysis and Reporting Software	0	0.00	$222,480	N/A	N/A	N/A	0%	3%
	Subtotal	0	0.00	$820,248	N/A	N/A	N/A	0%	10%
Total	Total	41,696	6.64	$7,939,196	$0.024	$0.19	$1,196	100%	100%

Table 3-11 below presents the 2012 portfolio costs, by program, segmented by the amount projected to be spent on incentives, program delivery, program marketing, utility program administration, and evaluation costs. Please refer to Table 3-8 for an explanation of activities included in each cost category.

Table 3-11. 2012 Summary Portfolio Implementation Costs

		2012							
		Incentives	Program Delivery	Program Marketing	Utility Program Administration	Evaluation	Total Cost/Budget	Lifetime Net Benefits ($)	Societal Cost Test (Program Level)
Residential	Efficient Products	$416,143	$221,561	$95,655	$10,510	$22,316	$766,185	$2,200,235	3.3
	Appliance Recycling	$40,250	$153,916	$19,417	$3,003	$8,663	$225,249	$217,529	1.7
	Res. New Construction	$123,200	$218,214	$51,212	$3,003	$15,825	$411,454	$500,837	1.7
	Existing Homes and Audit Direct Instal	$968,200	$341,474	$196,451	$3,003	$45,274	$1,554,402	$196,354	1.1
	Shade Tree	$28,000	$24,482	$2,624	$3,003	$2,324	$60,433	$107,030	1.9
	Low Income Weatherization	$324,000	$11,215	$3,352	$3,003	$10,247	$351,817	$10,266	1.0
	Multi-Family	$26,178	$42,158	$6,834	$3,003	$3,127	$81,300	$235,199	3.9
	Subtotal	$1,925,971	$1,013,020	$375,545	$28,528	$107,777	$3,450,840	$3,467,451	1.8
Commercial	C&I Facilities	$1,256,011	$381,846	$327,571	$14,264	$79,188	$2,058,880	$3,258,155	3.0
	Bid for Efficiency - Pilot	$240,000	$27,943	$40,191	$3,003	$12,445	$323,583	$443,480	2.7
	Retro-Commissioning	$198,000	$13,730	$31,759	$3,003	$9,860	$256,352	$630,594	3.7
	Schools Facilities	$154,222	$23,404	$9,414	$3,003	$7,602	$197,645	$489,990	4.6
	Subtotal	$1,848,233	$446,923	$408,936	$23,273	$109,095	$2,836,460	$4,822,219	3.1
Behavior	Home Energy Reports	$256,600	$22,819	$13,971	$7,507	$12,036	$312,933	$118,271	1.4
	Behavioral Comprehensive Program	$252,270	$218,493	$25,000	$3,003	$19,951	$518,716	$1,030,890	3.0
	Subtotal	$508,870	$241,311	$38,971	$10,510	$31,986	$831,649	$906,050	2.4
Support Programs	Education and Outreach*	$0	$132,500	$4,500	$2,102	$2,782	$141,884	$0	N/A
	Residental Energy Financing*	$166,670	$194,431	$52,843	$3,003	$9,659	$426,606	$0	N/A
	Codes Support*	$0	$23,044	$3,457	$1,652	$1,126	$29,278	$0	N/A
	Program Development, Analysis and Reporting Software	$0	$222,480	$0	$0	$0	$222,480	-$222,480	N/A
	Subtotal	$166,670	$572,454	$60,800	$6,757	$13,567	$820,248	-$222,480	N/A
Total	Total	$4,449,744	$2,273,708	$884,253	$69,067	$262,425	$7,939,196	$8,973,240	2.2
	Percent of Cost by Category	56%	29%	11%	1%	3%	100%		

* Lifetime Net Benefits are adjusted to $0. Benefits are likely to equal costs; however at this time they are not quantified

D. Review of Different Benefit-Cost Tests and Results

As required in the Cost Effectiveness section of EE Standard (R14-2-2412), UNS Electric must ensure that the incremental benefits to society of the overall DSM portfolio exceed the incremental costs to society using the Societal Cost Test. For a full description of inputs to conduct a Societal Cost Test ("SCT"), please refer to Benefit/Cost Analysis of DSM Programs – A Guide for Arizona Investor Owned Utilities included in Exhibit 1. This paper was developed in cooperation with Arizona Public Service Corporation ("APS") and a collaborative group of stakeholders in 2010 and presented to Commission Staff as the utility requested methodology for application of the SCT. For the analysis of program benefits, a software program we will term *NAVdesign* was developed by Navigant Consulting, Inc. for use by UNS Electric. *NAVdesign* applies avoided cost savings generated by each measure or program, across the entire portfolio. Measure and program level benefit-cost details are available in the appendices.

Program Development

Program development involves the selection of technologies to include in a program, estimates of participation levels and estimates of program costs. It is obviously necessary for a portfolio of programs to be cost-effective. However, there are multiple and often contradictory perspectives on cost effectiveness. Alternative perspectives are described below.

Types of Benefit-Cost Tests

As detailed in Table 3-12, there are five major benefit-cost tests commonly utilized in the energy efficiency industry, each of which addresses different perspectives. The Arizona EEES established that the societal cost test should be used as the key perspective for judging the cost-effectiveness of the energy efficiency measures and programs. Regardless of which perspective is used, benefit-cost ratios greater than or equal to 1.0 are considered beneficial. While various perspectives are often referred to as tests, the following list of criteria demonstrates that decisions on program development go beyond a pass/fail test.

Table 3-12. Comparative Benefit-Cost Tests

	SOCIETAL TEST	TOTAL RESOURCE COST TEST	PROGRAM ADMINISTRATOR COST TEST (Utility Test)	PARTICIPANT COST TEST	RATE IMPACT MEASURE TEST
BENEFITS					
Reduction in Customer's Utility Bill				X	
Incentive Paid by Utility/Program Administrator				X	
Any Tax Credit Received		X		X	
Avoided Supply Costs	X	X	X		X
Avoided Participant Costs	X	X		X	
Participant Payment to Utility (if any)			X		X
External Benefits	X				
COSTS					
Utility Admin Costs	X	X	X		X
Participant Costs	X	X		X	
Incentive Costs			X		
External Costs	X				
Lost Revenues					X

Although only required to submit a SCT, UNS Electric evaluated the cost-effectiveness of the measures, programs and overall portfolio based on all of the following standard tests:

Utility Resource Cost Test

The Utility Resource Cost Test ("UCT"), also referred to as the Program Administrator Test ("PAT") measures the net benefits of a DSM program as a resource option based on the costs and benefits incurred by the utility (including incentive costs) and excluding any net costs incurred by the customer participating in the efficiency program. The benefits are the avoided supply costs of energy and demand, the reduction in transmission, distribution, generation and capacity valued at marginal costs for the periods when there is a load reduction. The costs are the program costs incurred by the utility, the incentives paid to the customers, and the increased supply costs for the periods in which load is increased.

Total Resource Cost

The Total Resource Cost ("TRC") is a test that measures the total net resource expenditures of a DSM program from the point of view of the utility and its ratepayers. Resource costs include changes in supply

and participant costs. A DSM program, which passes the TRC test (i.e., a ratio greater than 1) is viewed as beneficial to the utility and its customers because the savings in electric costs outweigh the DSM costs incurred by the utility and its customers.

Participant Cost Test

The Participant Cost Test ("PCT") illustrates the relative magnitude of net benefits that go to participants compared to net benefits achieved from other perspectives. The benefits derived from this test reflect reductions in a customer's bill and energy costs plus any incentives received from the utility or third parties, and any tax credit. Savings are based on gross revenues. Costs are based on out-of-pocket expenses from participating in a program, plus any increases in the customer's utility bill(s).

Rate Impact Measure Test

The Rate Impact Measure ("RIM") Test measures the change in utility energy rates resulting from changes in revenues and operating costs. Higher RIM test scores indicate there will be less impact on increasing energy rates. While the RIM results provide a guide as to which technology has more impact on rates, generally it is not considered a pass/fail test. Instead, the amount of rate impact is usually considered at a policy level. The policy level decision is whether the entire portfolio's impact on rates is so detrimental that some net benefits have to be forgone.

Societal Cost Test

The SCT is similar to the TRC test however it is also intended to account for the effects of externalities (such as reductions in carbon dioxide ("CO_2"), nitrogen oxides ("NOx"), and sulfur dioxide ("SO_2"). One additional difference between the TRC and the SCT is that the SCT uses a societal discount rate in the analysis. The SCT is the regulated benefit cost analysis required in the EEES and UNS Electric has provided a SCT that accounts for the societal discount rate. UNS Electric is however, unable to provide a true societal test given the uncertain values of environmental externalities. As required by the Commission, UNS Electric will work in 2011 with stakeholders to develop appropriate metrics and monetize costs for water, SOx, PM10, and NOx emissions savings as part of the societal cost test in program filings and Energy Efficiency Implementation plans but until a true market is available for CO_2, CO_2 will not be separately monetized. In compliance with Commission Decision No. 72028 (December 12, 2010) for TEP, UNS Electric will re-file the societal costs with the results of the stakeholder meetings. Table 3-13 summarizes results of the various program level cost effectiveness tests.

Table 3-13. Comparative Benefit-Cost Test Results

		2011-2012 Total				
		Societal Cost Test	Total Resource Cost Test	Utility Cost Test	Participant Cost Test	Ratepayer Impact Test
Residential	Efficient Products	3.9	3.3	3.8	9.8	0.6
	Appliance Recycling	1.7	1.4	2.1	5.3	0.5
	Res. New Construction	1.6	0.9	1.7	1.3	0.8
	Existing Homes and Audit Direct Inst	1.1	0.7	0.9	1.5	0.6
	Shade Tree	1.8	1.2	2.4	2.2	0.7
	Low Income Weatherization	1.0	0.7	0.3	2.5	0.2
	Multi-Family	3.9	3.2	3.2	16.3	0.5
	Subtotal	1.8	1.4	1.7	3.3	0.6
Commercial	C&I Facilities	2.9	2.1	2.7	4.4	0.6
	Bid for Efficiency - Pilot	2.7	2.2	2.7	4.4	0.6
	Retro-Commissioning	3.7	3.0	3.7	5.7	0.6
	Schools Facilities	3.7	2.8	2.8	7.0	0.6
	Subtotal	3.0	2.2	2.8	4.6	0.6
Behavior	Home Energy Reports	1.4	1.3	1.3	4.2	0.4
	Behavioral Comprehensive Program	4.0	3.4	3.3	10.5	0.5
	Subtotal	2.9	2.6	2.6	7.6	0.5
Support Programs	Education and Outreach	N/A	N/A	N/A	N/A	N/A
	Residential Energy Financing	N/A	N/A	N/A	N/A	N/A
	Codes Support	N/A	N/A	N/A	N/A	N/A
	Program Development, Analysis and Reporting Software	N/A	N/A	N/A	N/A	N/A
	Subtotal	N/A	N/A	N/A	N/A	N/A
Total	Total	2.2	1.7	2.0	4.2	0.6

Table 3-14 below summarizes the benefit-cost ratio of the DSM portfolio using the societal cost test as well as showing results of several other methods of calculating cost effectiveness.

Table 3-14. DSM Portfolio Cost Effectiveness

Year	Societal Cost Test	Total Resource Cost Test	Utility Cost Test	Participant Cost Test	Ratepayer Impact Test
2011 - Portfolio	2.1	1.6	1.9	4.5	0.5
2012 - Portfolio	2.2	1.7	2.1	4.0	0.6
2011-2012 Total	2.2	1.7	2.0	4.2	0.6

E. Environmental Benefits

UNS Electric estimates that implementation of the proposed portfolio will result in significant reductions in CO_2, NOx and SO_2 from fossil fuel power plant emissions over the lifetime of the installed efficiency measures. Table 3-15 below details both annual and lifetime environmental benefits of the 2011 and 2012 portfolio.

Table 3-15. Environmental Benefits

	2011-2012 Total					
Year	Annual CO2 Savings (Metric Tons)	Annual NOx Savings (Metric Tons)	Annual SOx Savings (Metric Tons)	Lifetime CO2 Savings (Metric Tons)	Lifetime NOx Savings (Metric Tons)	Lifetime SOx Savings (Metric Tons)
2011 - Portfolio	12,792	1.49	0.05	78,805	10.9	0.38
2012 - Portfolio	16,967	2.10	0.07	122,470	17.0	0.59
Total	29,759	3.59	0.12	201,275	27.9	0.96

IV. Residential Programs

The following section presents updates of UNS Electric's residential programs, with specific focus on new measures and proposed changes consistent with requirements of Section R-14-2-2407 of Decision No. 71436. This section also presents a summary discussion of UNS Electric's new programs. Detailed program descriptions and cost-effectiveness results for each new program are included in the appendices.

A. Efficient Products

UNS Electric is requesting budget approval and approval to offer additional measures shown in Table 4-1 below beginning in 2012.

Program Description

This is an existing program, approved previously by the Commission in Decision No. 70556 (October 23, 2008). The Efficient Products Program (formerly called CFL Buy-Down Program) is being re-named to recognize that it will serve as the delivery channel to address other efficient products, beyond CFLs, rebated through the major retail channels. This program promotes the purchase of energy efficient retail products (e.g., CFLs) through in-store buy-down promotions and starting in 2012 the promotion of energy efficient pool pumps, pool timers, residential LED lighting and advanced power strips.

Program Objectives and Rationale

The new measures will offer residential customers additional opportunities to reduce their energy consumption, and further the market transformation process through retail partnerships, training of retail staff, and increased stocking and selection for efficient retail products.

New Measures for 2011-2012

Table 4-1 presents new measures to be rebated by the program in 2011 and 2012.

Table 4-1. Measure Efficiencies, Incentive Level, and Participation, Benefit-Cost

Measure Name	Base Efficiency	High Efficiency	Avg. Incentive Per Unit	Unit Basis	2011 Est. Units	2012 Est. Units	Measure Level Societal Cost Test
Pool Pump Timers	no timer	Pool Pump Timers	$75	Per Unit	-	-	3.9
Variable Spd Pool Pump	single speed baseline	Variable Spd Pool Pump	$200	Per Unit	-	-	2.2
Residential LED light (A19 type bulb)	64W Incd/Halogen	10 W LED	$30	Per Bulb	-	5,000	1.2
Advanced Power Strips - Load Sensor	standard strips	Smart Strips - Load Sensor	$10	Per Sensor	-	5,000	2.2

*Additional detail on measure level savings, societal benefits/costs, and environmental benefits of both new and existing measures is included in Appendix I.

Delivery and Marketing Strategy

No significant changes in implementation approach or delivery strategy, except for the addition of new measures starting in 2012. Delivery channel for the new measures will continue to be via a combination of both buy-downs and possible mail-in rebates with participating retailers.

Program marketing is primarily through mass-market channels (e.g. radio, newspaper, website, etc.) and through education and training of participating retailers.

Measurement, Evaluation, and Research Plan

The Measure, Evaluation, and Research ("MER") Plan is consistent with previously filed strategy; however it will incorporate review of the new measures and delivery tactics.

B. Appliance Recycling

UNS Electric is requesting budget approval for a new Appliance Recycling program in 2011. A full program description and benefit-cost analysis is included in Appendix A.

Program Description

This is a new program, starting in 2011, which will be an ongoing element of the program portfolio. The Program will target the removal and recycling of operable second refrigerators and freezers. An appliance recycling contractor will provide turnkey implementation services that include verification of customer eligibility, scheduling of pick-up appointments, appliance pick-up, and recycling services.

Program Objectives and Rationale

The objective of the program is to produce long-term electric energy savings in the residential sector by permanently removing operable second refrigerators and freezers from the power grid and recycling them in an environmentally safe manner.

New Measures for 2011-2012

The following table presents new measures to be rebated by the program in 2011 and 2012.

Table 4-2. Measure Efficiencies, Incentive Level, and Participation, Benefit-Cost

Measure Name	Base Efficiency	High Efficiency	Avg. Incentive Per Unit	Unit Basis	2011 Est. Units	2012 Est. Units	Measure Level Societal Cost Test
Refrigerator Recycling	2nd fridge plugged in	remove 2nd fridge	$35	Per Unit	1,035	1,035	4.0
Freezer Recycling	2nd freezer plugged in	remove 2nd freezer	$35	Per Unit	115	115	3.1

*Additional detail on measure level savings, societal benefits/costs, environmental benefits of new measures is included in Appendix A.

Delivery and Marketing Strategy

The program delivery strategy consists of a third party implementation contractor who will provide implementation services, including eligibility verification and scheduling of pick-ups and delivery to proper disposal and recycling centers. The IC will also coordinate prompt processing of incentive payments.

Program marketing will be primarily through mass-market channels (e.g. radio, newspaper, website, etc.) and through brochures. Materials will carry a strong consumer education message and leverage the ENERGY STAR® brand. The program will be marketed at retail point-of-sale to increase customer awareness of the program.

Measurement, Evaluation, and Research Plan

An overview of the MER plan for this program is included as part of the larger program design filing, detailed in Appendix A.

C. Residential New Construction

UNS Electric is requesting budget approval to continue this program with no additional modifications.

Program Description

This program is a continuation of the existing program design that was approved by Decision No. 71641 (April 4, 2010) for the "Zero Net Energy Homes" residential new construction program. The program is designed with an incentive schedule that awards larger incentives for more efficient homes. To qualify for an incentive, homes must be tested by an approved energy rater, and meet one of the three tiers in the program based on a Home Energy Rating System ("HERS") Index score. On the HERS index scale, a score of 100 is considered the average efficiency of baseline new construction. A HERS index score of 0 represents a home that produces all of its energy through on-site generation from renewable energy. Therefore, the lower the HERS score, the more efficient the home. Tier 1 requires a minimum of a HERS that is <= 85, Tier 2 requires a minimum of HERS <= 70, and Tier 3 requires a minimum of HERS <=45.

Program Objectives and Rationale

The objectives of the residential new construction program are to advance energy efficient building practices through builder training, and customer awareness of the benefits of energy efficient construction, combined with application of and renewable technologies, such a solar photovoltaic and solar hot water systems consistent with achieving the goals of Arizona Renewable Portfolio Standard.

New Measures for 2011-2012

No new measures in particular are anticipated for 2011 or 2012.

Delivery and Marketing Strategy

Program delivery is provided by UNS Electric staff and participation of independent RESNET approved home energy raters (HERs). The contractor provides outreach to targeted builders, conduct builder training on marketing ENERGY STAR® homes and on the ENERGY STAR® performance standard, and coach and mentor participating builders and raters.

The program is marketed to select builders primarily through direct business-to-business contacts. The program is marketed to consumers at home shows, parade of homes, and other events focused on home-building as advertised through mass market and targeted media outlets.

Measurement, Evaluation, and Research Plan

The MER plan is consistent with previously filed strategy.

D. Existing Homes and Audit Direct Install

UNS Electric is requesting budget approval to continue this program with no additional modifications.

Program Description

The Existing Homes and Audit Direct Install Program is a newly approved a program that replaces the former Residential HVAC Program. The program was approved by the Decision No. 72024 (December 10, 2010). The Program is targeted to all existing homes in need of energy efficiency improvements. The program has two components, an initial energy audit with direct install of CFLs and advanced power strips, followed by identification of actionable, larger scale home energy efficiency improvements and referral to local Building Performance Institute (BPI) certified contractors to implement major home energy improvements such as insulation, air-sealing, HVAC, etc..

UNS Electric plans to submit the Existing Home Program to EPA with a request to utilize EPA labeling as Home Performance with ENERGY STAR®.

Program Objectives and Rationale

The program achieves energy and demand savings from the installation of energy efficient measures and contributes toward transforming the industry to emphasize best practice building science principles. The program invests in training and mentorship of participating contractors to understand the "house as a system" building science and to achieve BPI certification. TEP has included a Residential Financing Pilot Program in this Plan for 2011-2012 which will be used to enhance participation in this program.

Delivery and Marketing Strategy

UNS Electric provides program management oversight and marketing. A third party implementation contractor will be responsible for recruitment, training, and mentorship of participating contractors and trained energy auditors, data tracking, rebate processing and technical support. Auditors will provide referrals to BPI certified contractors and referral information will be reported to UNS Electric. Measure installation to residential customers will be provided by participating independent contractors. In 2011-2012 program delivery will be coordinated with APS and Southwest Gas Corporation ("Southwest Gas") to address programming overlap among the utilities.

UNS Electric provides program marketing and customer awareness-building through website promotion, community interest groups, mass-market channels (e.g. radio, newspaper, etc.), brochures and bill inserts, high bill inquiries, trade ally marketing efforts, contractor enrollment and training.

Measurement, Evaluation, and Research Plan

The MER plan is consistent with previously filed strategy.

E. Shade Tree

UNS Electric is requesting budget approval to continue this program with no additional modifications.

Program Description

The Shade Tree program is an ongoing element of the program portfolio, approved in Decision No. 70523 (September 30, 2008). The Program promotes energy conservation and environmental benefits by motivating customers to plant desert-adapted trees in targeted locations where the trees will provide shade to habited dwellings, thus reducing HVAC load.

Program Objectives and Rationale

The objectives of the program are to promote the strategic planting of trees to provide shade, thereby reducing the cooling load of homes and associated energy usage and to educate school-age children and the public on the conservation and environmental benefits of planting trees.

New Measures for 2011-2012

No new measures included in the program for 2011 and 2012.

Delivery and Marketing Strategy

UNS Electric provides coupons to customers from DSM funds for the planting of trees within the guidelines that provide kWh savings. Once customers purchase approved trees, they return an application and a copy of the paid invoice to UNS Electric and receive a credit on their electric bill.

UNS Electric is looking to modify the marketing of this program to improve subscription in the Shade Tree program. UNS Electric will investigate alternate methods of delivery including partnerships with community organizations, boy scouts, or other associations. UNS Electric may also attempt to host

independent sessions and invite customers to drive to one location and pick up trees. UNS Electric employees currently inform customers about the program during speaking engagements and outreach presentations and coupons are printed in newspapers. Other efforts entail website promotion, newspaper advertising, planting and care brochure, presentations at schools, tree tours, and tree care workshops.

Measurement, Evaluation, and Research Plan

The MER plan is consistent with the previously filed strategy.

F. Low Income Weatherization

UNS Electric is requesting budget approval to continue this program and approval to modify income eligibility from 150% of poverty level to match the poverty level set by Low Income Home Energy Assistance Program ("LIHEAP") as it may change from time to time. The current level set by LIHEAP is 200% of poverty level.

Program Description

The Low Income Program is an ongoing element of the Program Portfolio and was approved by Decision No. 70347 (May 16, 2008). The Program helps conserve energy and lower utility bills for UNS Electric households with limited incomes by funding the weatherization of eligible homes. Weatherization measures fall into four major categories of duct repair, pressure management/infiltration control, attic insulation, and repair or replacement of non-functional or hazardous appliances. Weatherization is conducted in accordance with the Weatherization Assistance Program ("WAP"), a program funded by the U.S. Department of Energy. Household income and participation guidelines will be consistent in an on-going manner with current policy criteria used by the Arizona Energy Office, a division of the Arizona Department of Commerce.

Program Objectives and Rationale

The objectives of the program are to coordinate with the Arizona Energy Office to follow approved state WAP rules when using funding from UNS Electric, to lower the average household energy consumption for low-income customers and to increase the number of homes weatherized annually. The program funding provides up to $3,000 per residence for energy efficient weatherization measures, equipment replacement and/or repair, etc. for low-income customers within the UNS Electric service area. Agencies are allowed to use up to 25% of their annual budget for Health and Safety related repairs. Agencies may request a waiver of the $3,000 limitation on a case-by-case basis.

New Measures for 2011-2012

No new measures included in the program for 2011 and 2012. However, UNS Electric requests approval to adjust the qualifying customer income levels to consistently match those set by LIHEAP. The current income threshold is 200% of the Federal Poverty Level. This change will benefit additional low income customers and streamline the process to determine eligibility by the agencies.

Delivery and Marketing Strategy

The program is delivered by Western Arizona Council of Governments ("WACOG"), Northern Arizona Council Of Governments ("NACOG") and Southeastern Arizona Community Action Program ("SEACAP"); all are State-approved weatherization agencies, providing program administration, planning, program promotion, coordination, participant eligibility and priority, labor, materials, equipment and entering results into tracking software. Funding is provided to all agencies from UNS Electric upon documentation of work completed.

Due to the popularity of the program, DSM revenues are not allocated for advertising and promotion. Program promotion occurs mainly through community action agency partners that deliver presentations to

community organizations, and/or by leaving information at neighborhood community and recreation centers, and by responding to calls directed from UNS Electric. UNS Electric also provides website promotion and information during speaking engagements and outreach presentations.

Measurement, Evaluation, and Research Plan

The MER plan is consistent with the previously filed strategy.

G. Multi-Family

UNS Electric is requesting budget approval for a new Muli-Famly program in 2012. A full program description and benefit-cost analysis is included in Appendix D.

Program Description

This is a new program offering for the 2011-2012 UNS Electric program portfolio and will target multi-family buildings with 5 dwelling units or greater. The Program will recruit multi-family building owners to participate in a direct-install campaign to install CFLs and low-flow water devices in individual units. Multi-family facility managers will also be referred to the C&I Facilities program to encourage measure installation for the common areas.

Program Objectives and Rationale

The energy efficiency potential in the multifamily housing market remains largely untapped and represents significant efficiency potential for the UNS Electric program portfolio. Due to various market barriers, such as split incentives, capital constraints, and lack of awareness, energy efficiency improvements typically fall far below other types of improvements on the priority list. Although the current rebate programs offer some opportunities for energy efficiency improvements in this market, primarily through the Efficient Products Program, there is not a comprehensive offering that addresses the unique needs of this market. Through the direct installation, and renovation/rehabilitation implementation framework, this program seeks to fill this important gap in the UNS Electric program portfolio and provide substantial energy savings.

The objectives of the program are to reduce peak demand and overall energy consumption in the multifamily housing market segment; to promote energy efficiency retrofits of both dwelling units and common areas in this market segment; and to increase overall awareness about the importance and benefits of energy efficiency improvements to the landlord and property ownership community

New Measures for 2011-2012

The following table presents new measures to be rebated by the program in 2011 and 2012.

Table 4-3. Measure Efficiencies, Incentive Level, and Participation, Benefit-Cost

Measure Name	Base Efficiency	High Efficiency	Avg. Incentive Per Unit	Unit Basis	2011 Est. Units	2012 Est. Units	Measure Level Societal Cost Test
ES Integral CFL	61W Incd/Halogen	14 W CFL	$2	Per Bulb	-	4,000	31.6
Low Flow Showerheads – Electric Only	4 GPM	1.5 GPM with hot water sensor	$40	Per Shower	-	400	5.1
Faucet Aerators – Electric Only	2.2 GPM	1.5 GPM	$2	Per Faucet	-	400	25.6

*Additional detail on measure level savings, societal benefits/costs, and environmental benefits of new measures is included in Appendix D.

Delivery and Marketing Strategy

In order to encourage energy efficiency upgrades in new construction, major renovation and rehabilitation projects, as well as, energy efficiency retrofits of existing structures, the program will initially offer the following delivery tracks:

- A direct installation of selected low cost energy efficiency improvements in existing complexes.
- Common area energy efficiency improvements in existing complexes will be handled through the C&I Facilities Program.

As the program develops and matures, UNS Electric will examine a third track for encouraging more comprehensive dwelling unit energy efficiency improvements in existing complexes that are not part of major renovation/rehabilitation projects.

Marketing and communications strategies will include notifying apartment managers and owners through updates to website, local newspapers and radio, bill messages and bill inserts, training seminars, call center on-hold messages, direct mail promotion, outreach to rental housing industry associations, and work with contractors and industry specialists. A primary emphasis will be placed on larger and older, less efficient complexes.

Measurement, Evaluation, and Research Plan

An overview of the MER plan for this program is included as part of the larger program design filing, detailed in Appendix D

V. Commercial & Industrial Programs

The following section presents updates of UNS Electric's previously approved Commercial and Industrial ("C&I") program, with specific focus on new measures and proposed changes consistent with requirements of Section R-14-2-2407 of Decision No. 70524 (September 30, 2008). This section also presents a summary discussion of UNS Electric's new programs. Detailed program descriptions and cost-effectiveness results for each new program are included in the appendices.

Regarding incentive levels, the tables below present the average incentive levels anticipated for the new measures. We specifically note that incentive levels are average as they represent the weighted result of the average incentive for a measure, which varies depending on the tons or horsepower of the equipment being rebated. Incentives that the public see for these measures may be slightly higher or lower, depending again on the size of the equipment under consideration. Overall, incentive levels have been designed to not exceed 75% of incremental costs, except for direct-install measures which are rebated up to 90% or at times 100% of incremental cost.

A. C&I Facilities

Program Description

UNS Electric is requesting budget approval to continue this program plus approval for adding these additional measures:

- Shade Screens
- Window Films
- Induction Lighting
- LED Channel Signs
- Outdoor CFL
- Reduced LPD
- T8 to T8
- Premium T8 Lighting
- Beverage Controls
- Snack Controls ("vending
- miser")
- Refrigerated Display
- Automatic Door Closers
- Refrigerated Display Gaskets
- Advanced Power Strips - Occupancy Sensors
- Advanced Power Strips - Timer Plug Strip
- Advanced Power Strips - Load Sensor
- Eliminate incentive cap
- Remove restriction on two large customer participation

Program Description

The UNS Electric C&I facilities program parallels the TEP Small Business Direct Install Program in all ways. It is an existing program, approved previously by the Commission in Decision No. 70524 (September 30, 2008). The Program offers incentives for a select group of retrofit ("RET") and replace-on-burnout ("ROB") energy efficiency measures in existing facilities. Eligible customers include small and large commercial customers. The program offers incentives for the installation of energy-efficiency measures including lighting equipment and controls, HVAC equipment, motors and motor drives, compressed air and refrigeration measures. In order to increase program participation, UNS Electric is requesting approval to remove the $10,000 incentive cap and the restriction that only two large commercial customers can participate at a limit of $50,000 incentive cap each year. These limiting

components of the approved program negatively impact participation and prevent UNS Electric from reaching participation goals.

Program Objectives and Rationale

The C&I Facilities program is designed to address the barriers to this market segment, including limited investment capital, limited awareness of energy cost savings, and required short-term payback. The program's purpose is to persuade small business customers to install high-efficiency equipment at their facilities and encourage contractors to promote the program.

New Measures for 2011-2012

The following table presents new measures to be rebated by the program in 2011 and 2012.

Table 5-1. Measure Efficiencies, Incentive Level, and Participation, Benefit-Cost

Measure Name	Base Efficiency	High Efficiency	Avg. Incentive Per Unit	2011 Est. Units	2012 Est. Units	Measure Level Societal Cost Test
Shade Screens	no screens	shading coeff: 0.24	$2/sq ft	400	680	1.7
Window Films	no film	shading coeff: 0.578	$2/sq ft	400	680	2.5
Induction Lighting	229 W Metal Halide	96 W Induction lamp	$141/lamp	5	9	3.5
LED Channel Signs	6W/ft Neon	1.2 W/ft LED	$9/linear ft	50	85	1.2
Outdoor CFL	112 W incand.	27 W CFL	$2.00/lamp	250	425	11.9
Reduced LPD	1.21 W/sqft	1.09 W/sqft	$1,371/building	2	4	3.4
T8 to T8	Standard T8	premium T8	$24/fixture	0	0	1.3
Premium T8	T12 Lamps	Premium T8	$33/fixture	8,800	14,960	2.2
Beverage Controls ("Vending Miser")	no controls	occupancy sensors	$150/sensor	10	17	6.3
Snack Ctrls	no controls	occupancy sensors	$75/sensor	10	17	2.4
Refrigerated Display Automatic Door Closers	standard doors	Automatic Door Closers	$40/door	10	17	7.4
Refrigerated Display Gaskets	no action	Replace Gaskets	$8/linear ft		0	1.5
Advanced Power Strips - Occupancy Sensors	standard strips	Smart Strips - Occupancy Sensors	$10/sensor	0	50	3.3
Advanced Power Strips - Timer Plug Strip	standard strips	Smart Strips - Timer Plug Strip	$10/sensor	0	50	1.7
Advanced Power Strips - Load Sensor	standard strips	Smart Strips - Load Sensor	$10	0	50	9.9

*Additional detail on measure level savings, societal benefits/costs, and environmental benefits of both new and existing measures is included in Appendix I.

Delivery and Marketing Strategy

The program is operated as an "up-stream" market program, offering incentives directly to pre-qualified installing contractors to provide turn-key installation services to customers, intended to reduce the measure payback to one year or less. The program also includes consumer and trade ally educational and promotional pieces designed to provide decision makers in the small business market with the information necessary to make informed choices (and increase awareness).

The marketing strategy includes education seminars tailored to the small business market, major media advertising, website promotion, outreach and presentations at professional and community forums, and direct outreach to customers.

Measurement, Evaluation, and Research Plan

The MER plan is consistent with previously filed strategy.

B. Bid for Efficiency

UNS Electric is requesting budget approval for a new Bid for Efficiency ("BFE") program in 2011. A full program description and benefit-cost analysis is included in Appendix E.

Program Description

UNS Electric proposes to implement the Program as a pilot during the 2011 through 2013 timeframe. Pilot results will be evaluated in 2013. If the market response and measure savings indicate the Program is cost effective, UNS Electric will include the full program offering in its 2014 DSM Implementation Plan.

The Bid for Efficiency Pilot Program is designed to take an innovative approach to energy efficiency by using elements of competition and the potential for high rewards to enhance customer interest. The BFE concept involves creating a pool of funds that are bid on through unique proposals which include costs, savings and incentives that are unique to that project. UNS Electric selects winning applicants based on specified criteria. The BFE concept is an innovative approach that is being successfully deployed in other jurisdictions. There are several market specific conditions that will determine the effectiveness for UNS Electric and so UNS Electric is proposing the BFE as a two year pilot program.

BFE participants and project sponsors may include commercial customers, ESCOs or other aggregators who organize proposals that involve multiple sites. The Pilot addresses customer market barriers such as small savings levels at multiple sites, longer payback periods and organizing implementation contractors and it offers a simplified application process. Results will be verified through Measurement and Verification ("M&V") activity.

Program Objectives and Rationale

BFE encourages customers and project sponsors to think creatively and to develop projects designed to optimize system energy use rather than considering the energy usage of each individual piece of equipment. The program will foster customer-driven project activity (e.g., customers will select appropriate measures and professionals to implement measures), and will encourage the implementation of comprehensive, multi-measure projects.

New Measures for 2011-2012

The following table presents new measures to be rebated by the program in 2011 and 2012.

Table 5-2. Measure Efficiencies, Incentive Level, and Participation, Benefit-Cost

Measure Name	Base Efficiency	High Efficiency	Avg. Incentive Per Unit	2011 Est. Units	2012 Est. Units	Measure Level Societal Cost Test
Bid for Efficiency	baseline building	Bid projects	$60,000/ customer	2	4	3.3

*Additional detail on measure level savings, societal benefits/costs, and environmental benefits is included in Appendix E

Delivery and Marketing Strategy

The program will be delivered through an implementation contractor. UNS Electric will promote the Bid for Efficiency Pilot Program through direct promotion to key customers and aggregators. Particular

emphasis will be paid to key market sectors that have historically been difficult to reach such as grocery and convenience stores. UNS Electric, and/or its implementation contractor, also may conduct informational meetings with potential participants and project sponsors to explain the program rules and encourage participation.

Measurement, Evaluation, and Research Plan

An overview of the MER plan for this program is included as part of the larger program design filing, detailed in Appendix E.

C. School Facilities

UNS Electric is requesting budget approval for a new School Facilities program in 2012. A full program description and benefit-cost analysis is included in Appendix G.

Program Description

The UNS Electric School Facilities Program ("Program") is a new program filed with the Commission on December 30, 2010 which is open to participation by all existing school facilities in the UNS Electric service territory, including charter schools. The proposed Program will utilize the same delivery method and pay incentives for the same demand side management ("DSM") measures as the existing UNS Electric C&I Facilities Program, but with a separate budget reserved for schools. Incentives for the Program will also be paid at a higher level than for the Efficiency Program.

- The Program will offer incentives for a select group of retrofit and replace-on-burnout ("ROB") energy efficiency measures in existing school facilities. The efficiency measures offered include high-efficiency lighting equipment upgrades, high-efficiency HVAC equipment, lighting controls, programmable thermostats, and selected refrigeration measures.
- The direct install component will utilize an on-line proposal generation and project tracking application to reduce the transaction costs. Proposed incentives for DSM measures are identical to the incentive structure in the UNS Electric C&I Facilities and; however UNS Electric proposes to pay up to 100% of incremental costs for schools. The Program will have a separate incentive budget of $ $71,901 starting in 2011 which is reserved exclusively for school use. If schools oversubscribe the budget, they will be allowed to request participation in the UNS Electric C&I Facilities Program which only pays up to 85% of incremental cost.

Program Objectives and Rationale

The primary goal of the Program is to encourage schools in UNS Electric's service territory to install energy efficiency measures in existing facilities. More specifically, the Program is designed to:

- Encourage schools to install high-efficiency lighting equipment and controls, HVAC equipment, and energy-efficient refrigeration system retrofits in their facilities.
- Encourage contractors to promote the Program and provide turn-key installation services to schools.
- Assure that the participation process is clear, easy to understand and simple.
- Increase the awareness and knowledge of school facility managers and other decision-makers on the benefits of high-efficiency equipment and systems.

Since 2008, participation by schools in the UNS Electric C&I Facilities Program has been modest. In order to increase participation in energy efficiency retro-fits by schools, UNS Electric has developed this Program, which proposes to fund up to 100% of installed costs while engaging the contractor community

to provide turn-key services. This is a 15% increase from the 85% allowed in the UNS Electric C&I Facilities Program. The Schools Program will follow the design of the UNS Electric C&I Facilities Program because the direct-install concept has a proven track record of high participation and cost-effective life cycle savings for hard-to-reach markets, including schools.

New Measures for 2011-2012

The following table presents new measures to be rebated by the program.

Table 5-3. Measure Efficiencies, Incentive Level, and Participation, Benefit-Cost

Measure Name	Base Efficiency	High Efficiency	Avg. Incentive Per Unit	2011 Est. Units	Measure Level Societal Cost Test
Custom Measures	no action	custom actions	$6,530/ customer	6	3.1
14 SEER Packaged and Split Air Conditioners	SEER 13	SEER 14	$438/unit	-	1.6
14 SEER Packaged and Split Heat Pumps	SEER 13	SEER 14	$438/unit	-	2.3
15 SEER Packaged and Split Air Conditioners	SEER 13	SEER 15	$878/unit	-	1.2
15 SEER Packaged and Split Heat Pumps	SEER 13	SEER 15	$878/unit	-	2.1
16 SEER Packaged and Split Air Conditioners	SEER 13	SEER 16	$1,319/unit	-	1.2
16 SEER Packaged and Split Heat Pumps	SEER 13	SEER 16	$1,319/unit	-	1.9
Programmable Thermostats	non-programmable	programmable	$200/unit	30	17
Shade Screens	no screens	shading coeff: 0.24	$4/sq ft	-	1.7
Window Films	no film	shading coeff: 0.578	$3/sq ft	-	2.4
Daylighting controls	no controls	daylighting controls	$749/kW base load	-	3.0
Delamping	T8s and T12s	Remove T8s and T12s	$6/fixture	90	51.1
Energy efficient exit signs	Incandescent/CFL sign	LED sign	$55/fixture	75	11.7
Hard Wire CFL	73 W Incandescent bulb	16 W CFL	$15/bulb	60	1.1
HIDs to T8/T5	400W Metal Halide	220 W T5/T8s	$93fixture	45	13.8
Induction Lighting	229 W Metal Halide	96 W Induction lamp	$194/lamp	-	3.5
Integral Screw In CFL	71 W Incandescent bulb	16.6 W CFL	$11/bulb	-	1.7
Occupancy sensors	no sensors	occupancy sensors	$95/sensor	12	4.0
Outdoor CFL	112 W incand.	27 W CFL	$9/lamp	20	11.9
Reduced LPD	1.21 W/sqft	1.09 W/sqft	$3,460/ building	-	3.3
Screw in cold cathode CFL	30 W Incandescent bulb	6W CFL	$12/bulb	-	5.2
T 8 Lighting	T12 Lamps	T8 Lamps	$31/fixture	40	0.8
T8 to T8	standard T8	premium T8	$20/lamp	0	2.2
Premium T8	Standard T12	Premium T8	$57/lamp	160	1.6
Beverage Ctrls ("vending miser")	no controls	occupancy sensors	$195/sensor	15	6.3
Snack Ctrls ("Vending Miser")	no controls	occupancy sensors	$100/sensor	15	2.4
Advanced Power Strips - Occupancy Sensors	standard strips	Smart Strips - Occupancy Sensors	$75/sensor	5	3.3
Advanced Power Strips - Timer Plug Strip	standard strips	Smart Strips - Timer Plug Strip	$19/sensor	-	1.7

Advanced Power Strips - Load Sensor	standard strips	Smart Strips - Load Sensor	$32/sensor	-	9.9

*Additional detail on measure level savings, societal benefits/costs, and environmental benefits of measures is included in Appendix G

Delivery and Marketing Strategy

UNS Electric will assign an in-house program manager to oversee the Program, provide guidance on program activities that is consistent with UNS Electric's goals and customer service requirements, and provide a contact point for schools that are interested in or have concerns about the Program. The implementation contractor will be responsible for application and incentive processing, monitoring the activities of the installing contractors, participation tracking and reporting, and overall quality control and management of the delivery process.

The marketing and communications strategy will be designed to inform schools of the availability and benefits of the Program and how they can participate. The strategy will include specific outreach to schools and to contractors who typically do retrofits in schools. An important part of the marketing plan will be content and functionality on the UNS Electric website, which will direct schools to information about the Program.

Measurement, Evaluation, and Research Plan

An overview of the MER plan for this program is included as part of the larger program design filing, detailed in Appendix G.

D. Retro-Commissioning

UNS Electric is requesting budget approval for a new Retro-Commissioning program in 2012. A full program description and benefit-cost analysis is included in Appendix F.

Program Description

The Retro-Commissioning (RCx) program would use a systematic approach to identify building equipment and processes that are not achieving optimal performance or results in existing facilities. Eligible program applicants will receive free screening energy audits. Participants will also receive training to ensure proper operating and maintenance practices over time.

Program Objectives and Rationale

The program seeks to generate significant savings for DSM portfolio objectives by tapping into energy savings opportunities present in existing commercial and industrial facilities. The program will deliver customer benefits by lowering energy bills and improving building performance and occupant comfort while reducing maintenance calls. The program will also facilitate the development of an RCx contractor pool, and will enable UNS Electric to develop relationships with commercial and industrial customers leading to other areas of participation in UNS Electric's portfolio of DSM programs. RCx programs in other utility service territories have been shown to deliver average facility savings in the range of 5-15% per facility, and measures implemented as a result of program activity typically pay for themselves in savings in less than two years.

New Measures for 2011-2012

The following table presents new measures to be rebated by the program in 2011 and 2012.

Table 5-4. Measure Efficiencies, Incentive Level, and Participation, Benefit-Cost

Measure Name	Base Efficiency	High Efficiency	Avg. Incentive Per Unit	2011 Est. Units	2012 Est. Units	Measure Level Societal Cost Test
Retro-Commissioning	baseline building	custom actions	$22,000/ 100k sq ft	-	9	4.6

*Additional detail on measure level savings, societal benefits/costs, and environmental benefits is included in Appendix F

Delivery and Marketing Strategy

The Program will be marketed using traditional forms of media (print, web, newsletters, etc.), as well as targeted direct mail and outreach to engineering and trade associations. UNS Electric and the implementation contractor will also reach out directly to contractors who currently are, or could be, practicing in this area. The UNS Electric website will also be updated to include information and links for participation in this initiative. Account managers will also be called upon to reach out to larger customers to encourage participation.

Measurement, Evaluation, and Research Plan

An overview of the MER plan for this program is included as part of the larger program design filing, detailed in Appendix F.

VI. Behavioral Programs "UES Energy Partnership"

This section also presents a summary discussion of UNS Electric's proposed new program offerings in the behavioral suite of programs. Detailed program descriptions and cost-effectiveness results for each new program are included in the appendices.

A. Behavioral Comprehensive

Program Description

The Behavioral Comprehensive program is a new program offering in the 2011-2012 program portfolio. This filing provides information on behavioral approaches which together are being called the "Behavior Comprehensive" Program.

Technology-based energy efficiency achieves only a finite amount of efficiency potential. The barriers to wider spread implementation of energy efficiency are sociological not technological. Capturing full energy efficiency potential requires behavior change. All energy efficiency programs need to integrate behavior change strategies into their DSM portfolios in order to fully realize their achievable potential. Behavioral initiatives apply to all UNS Electric customers. The focus for this effort is on behavioral change within residences.

The types of behaviors to be influenced include:

- Habitual behaviors
  - » Adjust thermostat setting
  - » Turn off unnecessary lights
- Small purchasing and maintenance behaviors
  - » Purchase and install faucet aerators and low flow shower heads
  - » Purchase and install compact fluorescent light bulbs
  - » HVAC maintenance
- Larger purchasing decisions
  - » Purchase an ENERGY STAR appliance
  - » Purchase higher EE heating and cooling system through participation in a UNS Electric DSM program

The Behavior suite of programs will use six delivery mechanisms to achieve its objectives as shown in Table 6-1.

Table 6-1. Summary of Behavioral Programs

Behavioral Programs			
1	Home Energy Reports		Comparison of energy use to that of neighbors
2	Behavior Comprehensive		
	2a	Direct Canvassing	Door to door awareness and direct install campaign
	2b	K-12 Education	Classroom education including take home direct install kits
	2c	Community Education	"train the trainer" approach and give away direct install kits
	2d	CFL Giveaway	CFL bulb giveaways at outreach events

Program Objectives and Rationale

The main objective of behavioral programs is to provide customers with more information to allow them to better understand and manage their energy usage. Several approaches are being implemented and will be assessed to determine the effectiveness and benefits of making this information available.
Some of the programs' major objectives include:

- Generate significant savings for DSM portfolio objectives
- Develop relationships with UNS Electric customers leading to other areas of participation in UNS Electric's portfolio of DSM programs
- Promote efficient building operations
- Lower energy bills for the consumer

New Measures for 2011-2012

Table 6-2 presents new measures to be implemented by the program in 2011 and 2012, description of base and high efficiency, and the schedule for implementation as noted by the year in which the initiatives will be rolled out.

Table 6-2. Measure Efficiencies, Incentive Level, and Participation, Benefit-Cost

Measure Name	Base Efficiency	High Efficiency	Avg. Incentive Per Unit	Unit Basis	2011 Est. Units	2012 Est. Units	Measure Level Societal Cost Test
K-12 Education Kit	no action	2 CFLs, Faucet Aerator, LED nightlight, Refrigerator thermometer	$25	Per Home	2,400	2,400	2.7
Community Education Kit	no action	2 CFLs, Showerhead, Faucet Aerator, LED nightlight, Refrigerator thermometer	$56	Per Home	-	-	2.9
Direct Canvassing	no action	2 CFLs	$3	Per Home	-	9,000	7.8
CFL Giveaway	no action	23W CFLs	$2	Per Home	75,000	-	11.2
CFL Giveaway	no action	18W CFLs	$2	Per Home	-	75,000	7.1

*Additional detail on measure level savings, societal benefits/costs, and environmental benefits of new measures is included in Appendix H.

Delivery and Marketing Strategy

All UNS Electric residential customers will be eligible for this program. Delivery will be offered to various groups of customers as selected by UNS Electric and those who attend events.
Delivery will be made through implementation contractors. Selection of contractors will be made through a request for proposal process.

Measurement, Evaluation, and Research Plan

An overview of the MER plan for this program is included as part of the larger program design filing, detailed in Appendix H.

B. Home Energy Reports

Program Description

UNS Electric's Home Energy Report Program now joins "Behavioral Comprehensive" as part of UNS Electric's comprehensive "Behavioral Energy Efficiency Programs" plan. The Program is designed to affect: (1) habitual behaviors like turning off the lights or adjusting the thermostat; and (2) maintenance behaviors such as changing furnace filters and cleaning refrigerator coils and (3) purchasing behaviors such as buying efficient light bulbs and appliances as well as participation in DSM programs. The program influences behavioral change in customers to reduce their energy consumption through targeted and comparative education and awareness of their energy consumption compared to others. The Home Energy Report does so through monthly or quarterly direct-mail reports on energy consumption and tips on how to save energy, at no cost to the customer. By making customers aware of their energy consumption patterns, especially in comparison with those of the other customers, it has been demonstrated to inspire behavior change toward energy efficiency.

The Pilot Program will be offered to a select group of residential customers, phased in at four levels. UNS Electric expects the target group of customers to be chosen based on their historical energy use (higher than average energy use). UNS Electric expects this group to include customers who display an annual consumption of 15,000 kilowatt hours ("kWh") or more for Phase 1 (15,000 customers with a control group). In Phase 2, first year program participation will be evaluated and the program refined according to findings, while in phase 3 (2nd program year), participation is planned to increase to 20,000 customers. Finally, in phase 4, an independent MER evaluation is planned.

Program Objectives and Rationale

The major objectives from this Program are to: generate significant savings for DSM portfolio objectives; educate and empower customers to take advantage of other DSM programs; promote efficient building operations; and lower energy bills for consumers.

New Measures for 2011-2012

The following table presents new measures to be implemented by the program in 2011 and 2012, description of base and high efficiency, and the schedule for implementation as noted by the year in which the initiatives will be rolled out.

Table 6-3. Measure Efficiencies, Incentive Level, and Participation, Benefit-Cost

Measure Name	Base Efficiency	High Efficiency	Avg. Incentive Per Unit	Unit Basis	2011 Est. Units	2012 Est. Units	Measure Level Societal Cost Test
Home Energy Reports	No action	2% savings	$0	Per Customer	15,000	20,000	1.4

Delivery and Marketing Strategy

The implementation contractor will deliver a turn-key program with responsibility for all aspects of customer selection, report generation, energy savings quantification, customer communications, and reporting.

All Home Energy Report products will be automatically mailed to the target market by the implementation contractor. Thus, no direct marketing is anticipated for this Program. UNS Electric will, however, jointly develop the marketing message contained in the Home Energy Reports with the contractor. The Program will also be included in the integrated marketing approach developed and used for all DSM measures.

Measurement, Evaluation, and Research Plan

The MER plan is detailed in the full program description in Appendix H.

VII. Support Programs

Support programs cut across the other program areas and provide technical and financial support for the effective implementation of all other programs.

A. Education and Outreach

UNS Electric is requesting budget approval to continue this program with no additional modifications.

Program Description

The Education and Outreach Program is an ongoing program, approved in Decision No. 70401 (July 3, 2008). The program is intended to increase participation in the Company's other DSM/EE programs, but is also intended to effect a broader market transformation that includes changes in customer's behavior. The program includes three basic educational components and a budget for program evaluation. The Academic Education section of the E&O program is now included in Section VIBehavioral Comprehensive in K-12 Education.

- General Energy Efficiency advertising component to cover seasonal ad's that encourage energy savings through energy saving tips, marketing the on-line energy audit, and marketing other energy efficiency programs to customers;
- On-Line Energy Audits and Carbon calculator from Aclara for inclusion on UNS Electric website. After approval of the Home Energy Reports Program, on-line audits will be included in Section VI under Behavioral Comprehensive (Home Energy Report – Opt In clause);
- Time-of-Use education to teach residential and small commercial customers about the benefits of TOU rates and enable customers to maximize savings through load shifting;
- Program evaluation.

Program Objectives and Rationale

The program consists of education and marketing intended to inform customers about the benefits of energy conservation and to inform those customers on how to achieve energy savings. Because the aim of this program is to change behavior it is difficult to objectively assess cost effectiveness or measure actual energy or environmental savings.

New Measures for 2011-2012

There are no new measures in this program for 2011-2012. The program includes only existing items approved in Decision No. (July 3, 2008) and because it consists only of education and marketing, the program did not require a cost-effectiveness test.

Delivery and Marketing Strategy

There are no significant changes in implementation approach or delivery strategy for the items in this program.

Measurement, Evaluation, and Research Plan

The MER plan is consistent with previously filed strategy.

B. Codes Support – Pilot

UNS Electric is requesting budget approval for a new Codes Support Pilot program in 2011. A full program description is included in Appendix C.

Program Description

The Energy Codes Enhancement Program (ECEP) will be an ongoing element of the UNS Electric portfolio. The Program will strive to maximize energy savings through adherence to local building energy codes across the local jurisdictions within UNS Electric service area. The program will employ a variety of tactics aimed at: 1) improving levels of compliance with existing building energy codes; and 2) supporting and informing periodic updates to energy codes as warranted by changing market conditions. Specific program activities will depend on the market needs expressed by local code officials and are likely to include a combination of efforts to:

- Better prepare code officials and building professionals to adhere to existing standards;
- Provide data and market insight to document the specific local benefits of code enforcement, and inform energy code changes over time;
- Ensure utility incentive programs align well with local energy codes;
- Collaborate with relevant stakeholders to help build a more robust community working to advance strong and effective building energy codes across the local jurisdictions within TEP, UNS Electric and UNS Gas service territories;
- Advocate for energy code updates over time.

Program Objectives and Rationale

Increase energy savings in new construction and renovated buildings in both the residential and commercial sectors through efforts to: 1) improve levels of compliance with existing building energy codes, and 2) support and inform periodic energy code updates as warranted by changing market conditions.

New Measures for 2011-2012

No new measures included in the program for 2011 and 2012.

Delivery and Marketing Strategy

Program activities will be selected based on research into effective approaches implemented in leading jurisdictions (e.g., California and Massachusetts), as well as feedback from local code officials, and municipal leaders in locations that currently lack building codes. Once program activities are selected, program staff will maintain a consistent level of activity and engagement with relevant stakeholders. Activities might include: participation in energy code adoption committees, technical support (calculations, research, information) to code adoption committees, public testimony in support of code adoption before city councils, ensuring that ongoing DSM programs align well with energy code requirements, and funding for local code agencies to enforce and improve energy code over time.

Marketing strategy will include website promotion, direct outreach to local code officials and networks of municipal leaders who are members of committees conducting activities related to building code enhancement and communications with other UNS Electric energy efficiency program implementation staff.

Measurement, Evaluation, and Research Plan

An overview of the MER plan for this program is included as part of the larger program design filing, detailed in Appendix C.

C. Residential Energy Financing

UNS Electric is requesting budget approval for a new Residential Energy Financing pilot program in 2011. A full program description is included in Appendix B.

Program Description

UNS Electric anticipates to start the Residential Energy Financing Program with a two year pilot program which will allow sufficient time to evaluate the Program, including participation, default rates, and overall value to customers. The Program will offer energy efficiency loans to UNS Electric customers who are seeking financing for the energy efficiency improvements to their homes. Loan proceeds can be used for energy efficiency measures that have been approved by the Commission as part of the Existing Homes/ Direct Install Program. The program may also offer classroom training sessions for contractors, and building professionals who will offer the financing program to customers, collaborate with the SWEEP and other regional groups to support research on utility financing programs; and work together with APS and Southwest Gas to determine a plan to 'partner' on financing programs offered in joint territories with different financing partners.

Program Objectives and Rationale

The Residential Financing Program's objective is to offer low interest unsecured loans for up to $15,000 for energy efficiency measures installed in existing homes. The Financing Program will provide customers with the capital needed to make cost-effective energy efficiency upgrades to their homes and is anticipated to improve customer participation as well as expand the pool of customers that can afford to participate in energy efficiency programs.

New Measures for 2011-2012

This program is a financing program used to support other program measure adoption. Therefore, there are no measures under this program.

Delivery and Marketing Strategy

A utility program manager will coordinate between the Lender and UNS Electric on all fund transfers, provide overall management, marketing oversight, planning and tracking of customer and contractor participation and coordinate all activities necessary to develop application forms and contractor training. Partnerships with community interest groups, HVAC, insulation, and air sealing contractors trained in Program procedures and Arizona Energy Office or other industry experts to provide training, education and awareness.

UNS Electric will provide Program marketing and customer outreach and awareness through a range of strategies including: website promotions, brochures, training and seminars for participating trade allies and contractors, and promotions through contractors and community interest groups.

Measurement, Evaluation, and Research Plan

An overview of the MER plan for this program is included as part of the larger program design filing, detailed in Appendix B.

VIII. Portfolio Management

UNS Electric will serve as the overall program administrator for delivery of the Energy Efficiency Portfolio. To expedite a quick launch of the programs, and to take advantage of cutting-edge program implementation experience from other parts of the country, UNS Electric plans to implement programs through a combination of third-party implementation contractors and utility staff. UNS Electric designs programs on the most cost-effective basis utilizing Implementation Contractor where they provide the lowest cost per kWh and likewise utilizing UNS Electric staff when appropriate. . Contractors will be selected through a competitive request for proposal process for delivery of programs.

UNS Electric anticipates providing high-level administrative, contract management, program design and marketing oversight of the selected implementation contractors. A portfolio of this proposed size and scope will require careful management oversight. UNS Electric will have a small and dedicated group of energy efficiency program staff overseeing third-party implemented programs and promotion of cross-sector education and awareness activities.

UNS Electric will also develop a comprehensive tracking database to ensure accurate and comprehensive recording of all program participation Additionally, the database will allow UNS Electric to research and track participation by customer class and geographic area, to identify trends and untapped opportunities to advance program goals. UNS Electric staff will also take primary responsibility for general energy efficiency education and awareness strategies and activities, including the corporate Web site, online energy audit software, mass-market general education and efficiency awareness promotions.

In summary, UNS Electric will provide comprehensive program contract oversight, strategic planning, including management, financial planning and budgeting, as well as:

- High-level guidance and direction to the implementation contractors, including review and revision of proposed annual implementation plans and proposed milestones, and, additionally, engage with the contractor team on a daily basis when working through strategy and policy issues.
- Review and approval of implementation contractor invoices and ensure program activities are within investment and on schedule.
- Review of implementation contractor operational databases for accuracy, ensuring incorporation of data into UNS Electric's comprehensive portfolio tracking database to be used for overall tracking and regulatory reporting.
- Review of measure saving estimates maintained by the implementation contractor.
- Oversight and coordination of evaluation, measurement, and verification contractors.
- Public education and outreach to community groups, trade allies and trade associations.
- Provide guidance and direction on new initiatives or strategies proposed by the implementation contractors.
- Communicate to implementation contractors other UNS Electric initiatives that may provide opportunities for cross-program promotion.
- Review and approve printed materials and advertising plans from Implementation Contractors.
- Create and provide collateral material for advertising on program delivered by the utility.
- Evaluate portfolio and program effectiveness and recommend modifications to programs and approach as needed.
- Perform periodic review of program metrics, conduct investment analysis, and review evolving program design.

A. Marketing and Outreach Strategy

The marketing and outreach strategy for this portfolio of programs will encourage participation among customers, key market players and trade allies. The objective of the marketing and communications strategy is to make customers and key market actors aware of program offerings and benefits, and to influence their decision making when purchasing or installing energy systems or equipment in favor of more energy efficient options.

The specifics of the marketing strategy will depend on the program and the demographics of the group being engaged. Depending on the market to be reached, marketing will generally include a mix of broadcast, Internet, print media, radio, direct contact, direct mail, bill inserts, or presentations. The program descriptions describe the proposed marketing approach for each program.

Additionally, UNS Electric will work with regional, state, and national programs and partners to optimize cooperative marketing programs and campaigns. Marketing efforts will be designed to dovetail with other statewide or regional efficiency programs and campaigns, including those offered by APS.

B. Tracking and Reporting

UNS Electric plans to build a comprehensive internal tracking and reporting system to record all activities from the energy optimization portfolio of programs. Data tracking systems are being used successfully in numerous other states, and UNS Electric intends to benefit from the learning that has occurred there. Implementation contractors will be responsible for tracking and reporting energy efficiency program activities by entering details of each project into the comprehensive data tracking system. The system will allow customized reporting to meet any reporting requirements in a quick, transparent and accurate manner.

C. Midstream Adjustments

While this plan presents detailed information on approach, energy efficiency measures and proposed incentive levels, unforeseen changing market conditions, will require regular review and revisions of portions of this plan to reflect new information. As such, adjustments to these programs will likely be necessary. When this is the case, the Commission will be updated in a timely manner and given opportunity to provide input.

D. Inter-Utility Coordination

UNS Electric will work with APS and other utilities to maximize the effectiveness of the programs; in particular, where gas and electric services overlap, regular communication and coordination will be necessary. This collaboration will involve working together to identify savings opportunities, as well as providing consistent messaging and parallel programs to reduce confusion and difficulty for customers and trade allies. UNS Electric intends to continue to collaborate with others to send cohesive marketing messages, as well as designing incentive programs, forms and incentive levels that are easily transferable with adjacent utilities.

E. Leveraging Other Efficiency Initiatives

Within Arizona, several entities are promoting energy efficiency including: the state government; SWEEP; U.S. Environmental Protection Agency and U.S. Department of Energy's "ENERGY STAR®" brand; as well as Federal tax credits. UNS Electric and its implementation contractors will work diligently to remain aware and up to date, and to cooperate with efficiency efforts being directed at Arizona energy users. Wherever feasible, co-marketing efforts will be employed in an attempt to send a clear and consistent message on the benefits of energy efficiency and the resources available to help achieve it. Additionally, UNS Electric is planning to benefit from experiences in other areas of the country by joining the Consortium for Energy Efficiency (CEE) and E-Source, which will provide UNS Electric

program managers information and contacts to assist with continuous program design and delivery improvements of the portfolio.

F. Trade Ally Coordination

Trade allies are essential to effective implementation of energy efficiency programs. Trade allies are considered program partners and will be treated accordingly. Relationships with trade allies will be cultivated and nurtured through numerous methods to ensure effective communication in both directions. Trade allies will be regularly informed of program progress. Changes and feedback from trade allies about "what is working and what is not" in the field are essential. To ensure good two-way communication, we will emphasize coordination, "listening sessions," and frequent communications with these key partners to advance program goals. A schedule of meetings, workshops, educational seminars, program update breakfasts, and clear and concise program descriptions will be distributed to the trade allies at the program kick off meetings. Ongoing training and program updates also will be a key part of program delivery.

IX. Measurement, Evaluation & Research

UNS Electric is required by the Commission to carry out MER activities as a means to verify program savings impacts and monitor program performance.[1] Evaluation activities will also benefit UNS Electric's DSM program efforts by documenting actual program level savings being delivered, identifying areas for improvement and helping to maximize the efficiency and effectiveness energy efficiency investments. The evaluation principles discussed in this section, and the detailed program-specific plans that will be presented in a separate research plan, are informed by the leading guidance documents in the DSM evaluation field. These documents include:

- U.S. EPA's Model Energy Efficiency Impact Evaluation Guide: A Resource of the National Action Plan for Energy Efficiency (2007)
- Efficiency Evaluation Organization's International Performance Measurement and Verification Protocol (2009)
- California Public Utility Commission's California Energy Efficiency Evaluation Protocols: Technical, Methodological, and Reporting Requirements for Evaluation Professionals (2006)
- EPRI's End-Use Performance Monitoring Handbook

What is referred to as MER in Arizona is often called program evaluation, measurement, and verification (EM&V) elsewhere. Effective EM&V ensures that expected results are measurable, achieved results are robust and defensible, program delivery is effective in maximizing participation, and the overall portfolio is cost-effective.

A. Definition of Evaluation, Measurement, and Verification

Evaluation encompasses process, impact and market evaluation activities as defined below:

Process Evaluations

Process evaluations are directed at addressing whether the programs were implemented as designed, examining perceived market barriers and opportunities, measuring participant satisfaction, documenting the program process, and exploring opportunities for efficiency improvements.

Impact Evaluations

Impact evaluations validate the energy and demand savings produced by a program. These evaluations validate program-reported savings by verifying the type, quantity and efficiency of measures installed, examining the measures replaced by the program for retrofit applications, or estimating the normal or standard baseline equipment for new construction applications.

Market Evaluations

Market evaluations examine program and market assessment "indicators" developed for each program and assess how these indicators change over time. The indicators are typically derived from a program logic formulation developed during program design and early implementation. The program logic model is a simple representation of the program and the underlying hypotheses that are expected to account for the program's success in the market. Typically, program logic models are organized around the program inputs, processes, and outputs. From this formulation, a set of key market indicators that can be tracked over time is developed (and modified over time, as needed).

- *Monitoring* includes developing a program data tracking system to support the evaluation effort; i.e., monitoring of results and verifying the installation and retention of measures and equipment promoted by the DSM program where appropriate.

[1] Arizona Corporation Commission Decision No. 71436 and A.C.C. R14-2-2415.

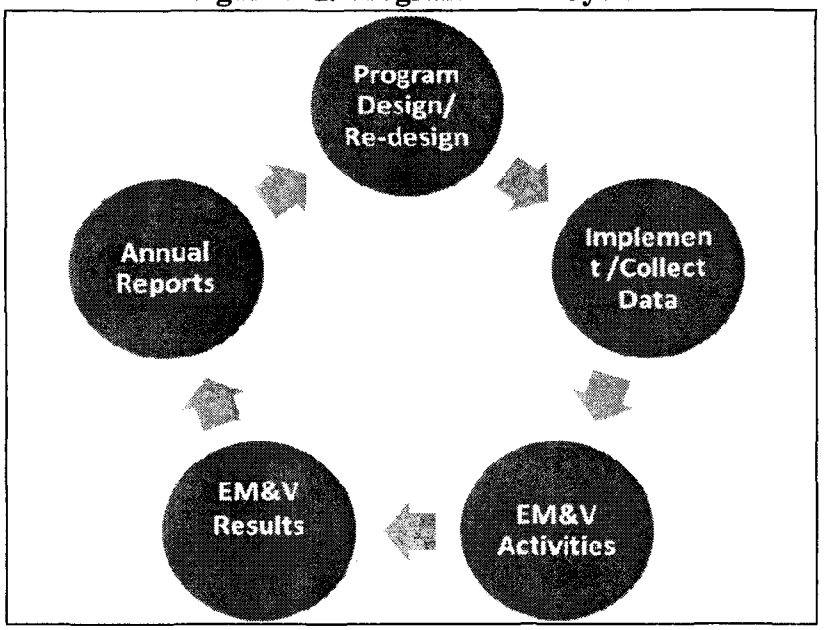
- *Verification* includes a review, audit, and verification of claimed program savings and recommendations for improvement.

B. Approach to Evaluation

The overall evaluation approach is based on an integrated cross-disciplinary model that includes evaluators as members of "project teams" involved in the various stages of program planning, design, monitoring and evaluation. This is a cost-effective method that has proven successful for other utilities.

Figure 9-1 below shows the program evaluation cycle. As shown, the stages of the program lifecycle inform one another. Findings from MER activities provide valuable inputs into program redesign, and the MER process plays an important role in enhancing program effectiveness and improving outcomes.

Figure 9-1. Program MER Cycle



This approach ensures the program evaluation effort is fair and objective. MER planning must consider a variety of factors in determining the timing and scope of evaluation activities to be conducted in a given year. These factors include distribution of regulatory requirements, savings across programs, available evaluation resources, and the stage of each program's implementation.

Approximately 4% of overall portfolio program costs will be allocated to the following activities. UNS Electric plans to invest an appropriate level of resources into the impact evaluation tasks to comply with regulatory requirements, but to ensure that sufficient resources are available to conduct market research. Allocating resources to process evaluation and market research is important because findings from this research will inform the future direction of the programs going forward.

C. Examples of EM&V Related Activities

Implementation and/or evaluation support contractors will assist in the development of key program and evaluation related components. These include:

- Compilation and review of the savings estimates used for prescriptive measures including measure savings assumptions, including base efficiency, high efficiency, measure size, measure life, free ridership, and spillover estimates.

- Review the portfolio tracking system database that captures measure and/or project data, develops initial estimates of savings, and retains participant information to assist with subsequent EM&V activities.
- Direct market baseline research and market characterization to support improved Plan implementation.
- Review program and measure cost-effectiveness

D. Project Savings Verification and Due Diligence

UNS Electric will work with implementation contractors to develop and implement quality assurance("QA")/quality control ("QC"), inspection, and due diligence procedures for those programs for which deemed savings are not appropriate. These procedures will vary by program and are necessary to assure customer eligibility, completion of installations, and the reasonableness and accuracy of savings. The activities that UNS Electric will undertake in performing MER procedures may include, but are not limited to, the following:

- Review custom rebate applications and project proposals for eligibility and completeness
- Inspect and verify a statistically valid sample of installations for purposes of ensuring compliance with program requirements
- Prepare and facilitate MER plans where needed based on the project, and assure adherence to IPMVP protocols

E. Independent Program Evaluations

Preliminary descriptions of proposed evaluations for each program are included in the program plans. The key components of the process and impact evaluations include:

- Evaluations conducted by an independent, DSM evaluation consultant. Verification, by an appropriate sample, that efficiency measures are installed as expected
- In-field measure performance measurement and data collection
- Energy and demand savings analysis to compute the results that are being achieved
- Cost-effectiveness analysis by program and overall DSM portfolio
- Process evaluation to indicate how well programs are working to achieve objectives
- Identification of important opportunities for improvement

F. Assessment of Annual Impacts

UNS Electric's MER contractor will prepare an annual report of energy efficiency program results, which will incorporate findings from evaluation activities completed that year, changes to programs, and new programs implemented, as well as gross and net savings and costs and cost-effectiveness results by program and portfolio. It is anticipated that the MER contractor's work, as well as participation in the process by the implementation contractor, will result in numerous areas where improvements and refinements are necessary.

UNS Electric will require implementation contractors or staff to routinely contact or visit a sample of participating customers to assess the quality of program delivery and the installation of measures for which incentives were claimed.

G. Coordinate Evaluation Activities with Other Players

As noted above, wherever it is practical and appropriate, evaluation activities will be conducted in conjunction with other utilities and agencies in the state to leverage funding and help ensure consistency.

X. Demand-Side Tariff

A.A.C R14-2-2405(A) requires UNS Electric to file its initial EE Implementation Plan within 30 days of the effective date of the Electric Energy Efficiency Standard (by January 31, 2011). A.A.C. R14-2-2405(A) also requires that subsequent plans be filed on June 1 of each odd year, making UNS Electric's next EE Plan due June 1, 2013. In order to inform the Commission of UNS Electric's plan to meet the 2012 EEES, UNS Electric is filing a two year implementation plan here (2011-2012). UNS Electric will file its EE Plan for 2013 on June 1, 2012, and will follow with its 2014-2015 EE Plan in June of 2013.

So that the Company can continue its effective implementation of the EEES, UNS Electric P requests that the DSMS as filed be reviewed and implemented by June 1, 2011. This expedited review and implementation of the DSMS will keep the Company's recovery of program costs on track with the previously implemented DSM Surcharge. Moreover, it will ensure no gaps in implementation or program delivery between the previously approved DSM Plan and the newly filed EE Plan, which is critical to the Company's recovery of program costs and is in the best interest of rate payers.

UNS Electric seeks approval of its proposed DSM Surcharge to recover two elements: (i) DSM program costs; and (ii) after tax DSM performance incentives. Specifically, UNS Electric is requesting approval to collect $16 million, $13.8 million in DSM program costs and $2.2 million in a pre-tax DSM performance incentive for 2011-2012. UNS Electric is also seeking approval to shift approved EE Plan funds between programs, and to moderately increase the budgets outlined in the 2011-2012 EE Plan where cost-effective.

A. Program Cost Recovery

UNS Electric is requesting approval to collect $13.8 million in total DSM Program Costs. Pursuant to A.A.C. R14-2-2410(A), a utility may recover the costs that it incurs in planning, designing, implementing, and evaluating a DSM program or measure. R14-2-2410 (D) also allows utilities to recover DSM costs concurrently, on an annual basis, with spending for a DSM program or DSM measure. Table 10-1 shows the total projected spending for this 2-year plan. This 2011-2012 DSM filing will not include a true-up for the 2010 DSM filing due to the timing changes resulting from implementation of the Energy Efficiency Standard. The timing requirements of the EE Standard will result in changing the DSM filing date from April 1 to January 31 for 2011. Thus, the 2010 DSM filing reflected costs associated with the calendar year 2010 with a specified recovery period beginning June 1, 2010 and ending May 31, 2011. The 2011-2012 DSM filing is being filed prior to May 31, 2011 (the end date for the recoveries associated with the 2010 expenses) and cannot reflect a reconciliation of the revenues recovered during the twelve months ending May 31, 2011 to the twelve months of costs incurred in the calendar year 2010. That reconciliation will occur when the 2013-2014 DSM filing is made.

Table 10-1. Total Projected Spending for 2011-2012

Cost Category	Costs
2011 - 2012 Program Costs	$13,329,591
Program Development, Analysis & Reporting Software	$438,480
Grand Total	$13,768,071

B. DSM Performance Incentive

Performance Incentive Summary

UNS Electric is requesting approval to collect $2.2 million in DSM Performance Incentives. The Commission has adopted the most stringent EE Standard in the country and utility Performance Incentives are widely recognized as a critical element to encourage utilities to extend efforts to meet or

even exceed stringent EE Standards. Regulators recognize the need for utility DSM Performance Incentives that:

- properly align all stakeholders' interest; and
- are recovered at the same time or closely following investment in EE Programs.

The EEES as described in R14-2-2411 allows utilities to propose a utility performance incentive. UNS Electric is requesting in this docket to structure the performance incentive using a shared incentive method based on a 10% share of "net" benefits (SCT measured) and with a 10% cap on spending for the 2011-2012 Implementation Plan.

2011 and 2012 Proposed Performance Incentive

UNS Electric is proposing to use shared incentives based on "net" benefits similar to the structure recommended by TEP. and proposes to use the performance incentive structure shown in Table 10-2 below. This proposal places a hard dollar cap based on 10% of net benefits rather than a cap on percent of spending. The hard dollar cap for 2011 and 2012 is proposed at $1,920,515 (after-tax). This structure is preferred over the percent spending cap because it encourages cost savings rather than spending to increase the performance incentive. The proposed tiered performance incentive, shown in table 10-2, encourages performance over and above the established Energy Efficiency Standard and rewards utilities for this performance if accomplished at a lower cost. This model creates an atmosphere where utilities will place more emphasis on programs with the best cost-effectiveness and the highest net-benefits. This proposed tier structure is currently approved for APS and UNS Electric supports the tiers shown in the table below. To truly capture the performance incentive UNS Electric is requesting approval for an after-tax Performance Incentive.

Table I0-2. Tiered Performance Incentive Model

Achievement of EE Goals	% of Lifetime Net Benefits
<85%	5%
85% - 95%	6%
96% - 105%	7%
106% - 115%	8%
116% - 125%	9%
>125%	10% (cap below)
Dollar Cap (2011 and 2012)	$1,920,515

- The performance incentive is calculated from the net benefits on the estimated annual energy reduction relative to the previous year's annual MWh sales as established in the EEES with the above spending cap.
- UNS Electric is requesting approval to recover the estimated after tax 2011 and 2012 Performance Incentive through an incremental increase in the EE adjustor mechanism. The Performance Incentive will be trued-up to actual costs and benefits from the 2011 and 2012 program years when UNS Electric files the 2013 and 2014 adjusted DSM Surcharge, respectively.
- The net-benefit ratio for all support programs including general Education and Outreach programs, Financing Programs, Codes and Standards, and for Low Income Programs is assumed to be 1.

The performance incentive for 2011 is $878,890 and $1,352,453 for 2012 based on UNS Electric meeting 100% of the 2011 and 2012 EES. Table 10-3 below shows the expected net benefits by program in 2011 and 2012.

Table I0-3. Net Benefits in 2011 and 2012

		2011			2012		
		Societal Benefit	Societal Cost	Net Societal Benefits	Societal Benefit	Societal Cost	Net Societal Benefits
Residential	Efficient Products	$2,844,399	$579,208	$2,265,191	$3,155,565	$955,330	$2,200,235
	Appliance Recycling	$540,528	$322,761	$217,767	$540,528	$322,999	$217,529
	Res. New Construction	$899,813	$607,261	$292,552	$1,259,739	$758,902	$500,837
	Existing Homes and Audit Direct Inst	$1,505,310	$1,470,063	$35,248	$2,227,199	$2,030,845	$196,354
	Shade Tree	$164,117	$92,465	$71,652	$229,763	$122,733	$107,030
	Low Income Weatherization	$251,600	$240,949	$10,651	$251,600	$241,333	$10,266
	Multi-Family	$0	$0	$0	$316,499	$81,300	$235,199
	Subtotal	$6,205,768	$3,312,707	$2,893,061	$7,980,892	$4,513,442	$3,467,451
Commercial	C&I Facilities	$5,118,951	$1,902,249	$3,216,702	$8,126,080	$2,709,299	$5,416,781
	Bid for Efficiency - Pilot	$535,748	$187,087	$348,660	$1,071,495	$403,583	$667,912
	Retro-Commissioning	$0	$0	$0	$1,205,432	$322,352	$883,080
	Schools Facilities	$419,879	$162,086	$257,793	$908,868	$199,125	$709,744
	Subtotal	$6,074,577	$2,251,422	$3,823,155	$11,311,875	$3,634,358	$7,677,517
Behavio r	Home Energy Reports	$305,853	$235,550	$70,303	$407,803	$289,533	$118,271
	Behavioral Comprehensive Program	$1,726,939	$309,683	$1,417,256	$1,549,606	$518,716	$1,030,890
	Subtotal	$2,032,791	$545,232	$1,487,559	$1,957,409	$808,249	$1,149,161
Support Programs	Education and Outreach*	N/A	$141,822	$0	N/A	$141,884	$0
	Residential Energy Financing*	N/A	$259,183	$0	N/A	$259,936	$0
	Codes Support*	N/A	$22,174	$0	N/A	$29,278	$0
	Program Development, Analysis and Reporting Software	$0	$216,000	-$216,000	$0	$222,480	-$222,480
	Subtotal	N/A	$639,178	-$216,000	N/A	$653,578	-$222,480
Total	Portfolio Total	$14,313,136	$6,748,540	$7,564,596	$21,250,176	$9,609,626	$11,640,550

* Net Benefits are adjusted to $0. Benefits are likely to equal costs; however at this time they are not quantified

The 2011-2012 after tax performance incentive at seven percent of the net benefits is $1,344,360 which is less than the $1,920,515 cap, as shown in Table 10-4 below.

Table I0-4. Performance Incentive for 2011 and 2012

	2011	2012	Total
Total Lifetime Net Benefits	$7,564,596	$11,640,550	$19,205,146
Calculated Performance Incentive*	$529,522	$814,838	$1,344,360
Proposed Performance Incentive Cap (10% of Lifetime Net Benefits)	$756,460	$1,164,055	$1,920,515
Performance Incentive (after-tax)	$529,522	$814,838	$1,344,360

*Assuming 100% of savings goal is reached, incentive is calcualted as 7% of lifetime net benefits

UNS Electric is requesting to collect $2,199,777 in the 2011 and 2012 adjustor. This includes $1,344,360 from Table 10-4 multiplied by the gross revenue conversion factor from the last rate case (1.6363) to determine the pre-tax amount. UNS Electric did not have a 2010 Performance Incentive approved.

Table 10-5 shows the Company's requested 2011 and 2012 Performance incentives at a pre-tax level.

Table I0-5. Performance Incentive for 2011 and 2012 Surcharge

	Performance Incenitve
2010	
2011 (pre-tax)	$866,456
2012 (pre-tax)	$1,333,320
Total	$2,199,777

C. Total DSM Surcharge

The total DSMS requested in this EE Plan is comprised of 1) Program Cost Recovery and 2) Utility Performance Incentive. The Company's proposed total DSMS for 2011-2012 is $.003350/kWh compared to the 2010 DSMS of $.000995. The 2011-2012 surcharge would contribute $2.81 per month to the average residential customer bill compared to $0.84 from the 2010 DSMS. UNS Electric is requesting approval to collect costs as shown below in Table 10-6.

Table 10-6. DSM Surcharge Total

DSM Surcharge Totals	2011	2012		Total
Program Budget	$5,828,874	$7,939,197		$13,768,071
Performance Incentive	$878,890	$1,352,453		$2,231,343
Total	$6,707,764	$9,291,650		$15,999,414
Requested Surcharge				$0.003350
Current Surcharge				$0.000995
Incremental Change				$0.002355

XI. Other Administrative Requests

Flexibility

In an effort to maintain participation in highly successful Energy Efficiency Programs, UNS Electric requests approval from the Commission, for the flexibility to shift approved funds between programs and to moderately increase the budgets outlined in the 2011-2012 EE Plan where it would be cost-effective to do so. Flexibility of this sort has proven itself valuable in the implementation of the REST and UNS Electric believes it is equally important here. In order to effectively and smoothly implement the EEES, utilities must be able to accept applications for customer inclusion in each energy efficiency program even though an individual program may, at the time, be oversubscribed. This type of flexibility is also necessary to maximize participation in the highly successful Commercial and Residential programs that UNS Electric administers. In order to facilitate this type of flexibility, UNS Electric respectfully requests Commission approval of the following language in its EE Plan approving Decision:

> *"UNS Electric will be allowed to shift up to 25% of approved funds from Residential to Commercial or from Commercial to Residential programs as deemed necessary based on program activity, and UNS Electric will be allowed the option of increasing up to 25% of the total Energy Efficiency budget where cost-effective, to continue participation until approval of the next regularly scheduled Energy Efficiency Implementation plan."*

In addition, UNS Electric would agree to evaluate program progress and requirements to shift funds from one program to another and to provide updates to the Commission at any interval requested by the Commission.

Reporting

Pursuant to A.A.C. R14-2-2409(D), UNS Electric requests that the reporting requirements in the EEES supersede the Company's existing reporting requirements as found in Decision No. 70360 (May 27, 2008) in Docket E-04204A-06-0783. Specifically, UNS Electric requests that the reporting requirements contained in R14-2-2409 replace (i) UNS Electric's April 1st surcharge filing requirement; and (ii) UNS Electric's requirement to file semi-annual reports on April 1st and October 1st of each year.

EXHIBIT 1

Memorandum

To: DSM Collaborative

From: UniSource Energy & APS

Date: October 1, 2010

RE: Arizona Benefit/Cost Analysis of DSM Programs Memo No. 1

Introduction:

The attached white paper presents recommendations from APS, UniSource Energy, and various DSM Collaborative group stakeholders on the interpretation of inputs and methodologies to be used when developing the societal benefit-cost test (SCT) as prescribed in the rulemaking on electric energy efficiency[1]. This document is intended to provide a consistent, efficient, and transparent method to assess the cost effectiveness of both planned and implemented DSM activities.

Key recommendations in the white paper include;

1. Avoided cost of energy will be stated as levelized costs and will be developed using the assumptions for the forecasted marginal production costs included in the integrated resource planning (IRP) model, with adjustments as appropriate for the impacts of the energy savings planned through the energy efficiency standard.
2. Until such time that the financial and legislative impacts of carbon mitigation are developed, the marginal production costs for energy will include an estimated cost of carbon that is imbedded in the marginal production cost of energy included in the IRP filed by each individual utility. As the IRP Rule sets forth, any interested party may provide, for the Commission's consideration, analyses and supporting data pertaining to environmental impacts.
3. Avoided cost of generation capacity will be stated as annual levelized costs based primarily on the cost of the next marginal unit identified in the IRP generation plan. Utilities may also use an approach that combines the next marginal unit cost and the cost of short term market capacity where appropriate.
4. The avoided cost of generation capacity will include the value of both principal and interest payments over the term of the debt incurred in installing these resources.
5. A societal discount rate will be used that will be based on the yield for U.S. Treasury securities up to a cap of 4%.
6. Administrative costs for energy efficiency measures will be applied at the level of program cost-effectiveness analysis and do not enter into the screening of individual DSM measures. Individual measure screening will be based on savings and measure incremental costs only.
7. The net-to-gross ratio will be assigned a value of 1 in cases where free ridership, spillover, and market influence effects cannot be measured or estimated with a reasonable degree of confidence.

This document is the result of DSM Collaborative meetings held on February 5th and May 18th, 2010, to begin the process of establishing a common framework between APS, TEP, and ACC for calculating benefit-costs of DSM activities. The results of the discussions were compiled and circulated for comment to all of the interested parties by Navigant Consulting. Comments, feedback and suggestions were then incorporated into this white paper guide.

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[1] Referenced in docket number RE-00000C-09-0427, the rulemaking on electric energy efficiency.

Benefit/Cost Analysis of DSM Programs: A Guide for Arizona Investor Owned Utilities

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I. Objective

This white paper presents the interpretation of inputs and methodologies to be used when developing the societal benefit-cost tests prescribed in docket number RE-00000C-09-0427[2], the proposed rulemaking on electric energy efficiency. The recommended inputs and methodologies are supported by APS and Unisource Energy and will allow Arizona IOUs to apply a consistent approach in screening the cost effectiveness of new energy efficiency measures and program offerings, and also in assessing the cost effectiveness of measures and programs already deployed. This document seeks to accomplish the following;

1. Provide a common approach between the utilities and Staff to conduct benefit cost analysis of DSM measures and programs being considered for implementation or being assessed after implementation;
2. Provide a screening process that is easy to use so that both the utilities and Staff can prepare their evaluations without delaying the implementation of programs to meet the Commission's aggressive savings targets;
3. Recognizes that benefit-cost assessment is ongoing, and that more refined analysis of cost effectiveness will be conducted during the monitoring and evaluation phase. Part of the data gathering process in the monitoring and evaluation phase will be devoted to getting better information on factors which are often uncertain in the initial measure screening phase and;
4. Provide synchronization between utility IRP and DSM activities.

The document is structured to provide a brief definition of the Societal Cost Test (SCT), followed by specific recommendations on benefit-cost test inputs and methodologies. A summary of key recommendations is then presented, followed by a glossary of terms.

II. Definition of the Societal Cost Test

The Arizona Corporation Commission (ACC) in Decision No. 71436 directed the public utilities in the state to design cost-effective Demand-Side Management (DSM) programs to meet the state's energy efficiency and load management objectives. The decision further states that the Societal Cost Test shall be used to determine cost effectiveness.

The SCT is structurally similar to the Total Resource Cost Test (TRC) but goes beyond the TRC test in that it attempts to quantify the change in the total resource costs to society as a whole rather than to only the service territory (the utility and its ratepayers). The main difference between the SCT and TRC Tests are the use of a societal discount rate and the capability to include the value of other societal benefits such as avoided environmental externalities (avoided pollution costs), non-energy benefits, reliability benefits, and fuel diversity. The ACC has chosen the term "Non-Market Benefits" to describe these benefits and has adopted the following definition:

> "'Non-market benefits" means the incremental improvements in social welfare that are not bought or sold.'

When expressed in terms of net present value, it is the ratio of the discounted total benefits of the program to the discounted total costs over some specified time period. The equation and terms of the SCT are defined as follows:

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[2] This document specifically pertains to sections R14-2-2401 and R14-2-2412 of the proposed standard

$$BCR_{SC} = (UAC_{NPV} + NMB_{NPV}) \div (PRC_{NPV} + PC_{N\text{-}NPV} + UIC_{NPV})$$

Where:

BCR_{SC} = Societal Benefit/Cost Ratio

UAC_{NPV} = Net Present Value of Utility Avoided Cost

NMB_{NPV}= Net Present Value of Non-Market Benefits (societal benefits) including environmental and other non-energy benefits

PRC_{NPV} = Net Present Value of Program Administrator Program Costs

$PC_{N\text{-}NPV}$ = Net Present Value of Net Participant Costs

UIC_{NPV} = Net Present Value of Utility Increased Supply Costs

Utility avoided costs (UAC) are defined as follows:

$$UAC = \Delta E_N \times ACE + \Delta D_N \times ACC + AECC$$

Where:

ΔE_N = Net energy savings

ACE = Avoided cost of energy

ΔD_N = Net demand savings

ACC = Avoided cost of capacity

AECC = Utility avoided environmental regulation compliance costs (e.g., carbon dioxide allowances, pollution control equipment).

III. Recommended Societal Cost Test Inputs and Methodologies

The following discussion provides recommendations on inputs and methodologies for each of the terms in the Societal Cost Test as defined above. The net present value of utility increased supply costs (UIC_{NPV}) is not addressed in this white paper because the rulemaking on electric energy efficiency is not intended to define the cost benefits of fuel switching programs, and because the SCT test cannot be applied meaningfully to load building programs.

A. Societal Discount Rate

The SCT allows for the use of a societal discount rate (SDR). The SDR is a reflection of a society's relative valuation on today's well-being versus well-being in the future. While no single method for determining the value of the SDR is agreed upon among industry practitioners, most agree that the value of the SDR is lower than rate of return selected for commercial investment decisions. The SDR used in evaluating energy efficiency programs and measures will be defined as follows;

- The SDR will be based on the yield from U.S. Treasury securities with a cap of 4%.
- The maturity of the Treasury security used to establish the SDR should be the same as the investment horizon of the discount rate used in the utility IRP. For example an IRP using a 20 year investment period would use the yield of the 20 year Treasury bond as the appropriate SDR.
- The date when the yield on the Treasury security is selected should be as close as possible to the date used to establish the discount rate used in the utility IRP.

B. Utility Avoided Cost (UAC)

Net Energy Savings (ΔE_N)

- Net Energy Savings will be defined by the following equation;

  $\Delta E_N = \Delta E_G \times (1 + ELLF) \times NTGR$

  Where:

  ΔE_N = Net energy savings

  ΔE_G = Gross energy savings (at the customer meter, not including NTG effects)

  NTGR = Net To Gross Ratio

- The value for the energy line loss factor (ELLF) will be determined by the most recent IRP.
- The calculation of the NTGR will include an estimation of free ridership, spillover and market influence factor (MIF) effects. Spillover is further defined as internal spillover and external spillover.
- The calculation of the net-to-gross ratio is conducted as follows:

  NTGR = 1 – FRF + SPF + MIF

  Where:

  FRF = Free ridership factor

  SPF = Spillover factor. This effect is comprised of two components defined as follows;

  - Internal spillover is typically defined as other measures installed in the same facility.
  - External spillover is typically defined as measures installed in other related facilities.

  MIF = Market influence factor. This factor is comprised of three components defined as follows;

  - Market Development Factor – The influence of programs on developing infrastructure, pipeline of products and service in the market, trade and professional expertise from training and education.
  - Market Maintenance Factor – The influence of programs in maintaining energy efficiency expertise and products and services in the market through ups and downs of business and economic cycles.
  - Market Transformation Factor -- The influence of programs on transforming the market over time.

- The NTGR will be assigned a value of 1 in cases where free ridership, spillover, and market influence effects cannot be measured or estimated with a reasonable degree of confidence.
- NTGR will be updated and reported through the MER process.

Avoided Cost of Energy (ACE):

- Avoided cost of energy will be stated as levelized costs and will be developed using the assumptions for the forecasted marginal production costs (MPC) included in the integrated resource planning model, with adjustments as appropriate for the impacts of the energy savings planned through the energy efficiency standard.
- The utilities should state if the energy efficiency standard was incorporated within the MPC model and how this was done.
- The period over which the levelized costs are presented will match the useful life of the measure or program being evaluated. For instance, if the measure life is 15 years, the value for the avoided cost of energy will be based on the levelized costs for a same 15 year period.
- The definition of summer and winter seasons, and also peak and off peak should be generally consistent with definitions used in TOU pricing structures and will be based on mutual agreement between staff and each utility and can vary by measures. At a minimum, avoided cost of energy values will be provided to ACC Staff in the following format:

On-Peak Summer	Determined from On-Peak Summer TOU hours
Off-Peak Summer	Determined from Off-Peak Summer TOU hours
On-Peak Winter	Determined from On-Peak Winter TOU hours
Off-Peak Winter	Determined from Off-Peak Winter TOU hours

Avoided Cost of Carbon:

- Until such time that the financial and legislative impacts of carbon mitigation are developed, the marginal production costs for energy will include an estimated cost of carbon that is imbedded in the marginal production cost of energy included in the IRP filed by each individual utility. As the IRP Rule sets forth, any interested party may provide, for the Commission's consideration, analyses and supporting data pertaining to environmental impacts.
- It is recognized that compliance costs associated with CO_2 emissions remains uncertain, and that factors such as pending legislation or developing markets that establish alternative values for CO_2 emissions may require this approach be revised.

Net Demand Savings (ΔD_N)

- Net Demand Savings will be defined by the following equation;

$$\Delta D_N = \Delta D_G \times (1 + DLLF + CRF) \times NTGR$$

- The value for the line capacity reserve factor (CRF) will be determined by the most recent IRP
- The value for the demand line loss factor (DLLF) will be determined by the most recent IRP.
- The value for NTGR will be the same as defined for avoided net energy savings

Avoided Cost of Generation Capacity (ACC):

- Avoided cost of generation capacity will be stated as annual levelized costs based primarily on the cost of the next marginal unit identified in the IRP generation plan. Utilities may also use an approach that combines the next marginal unit cost and the cost of short term market capacity where appropriate.
- The avoided cost of generation capacity will include the value of both principal and interest payments over the term of the debt incurred in installing new capacity resources.

C. Program Administrator Program Costs (PRC)

Program administrative costs are all non-incentive costs incurred by the utility in the process of operating and delivering DSM programs. These costs include management, administration, marketing, training, implementation services, and measurement and evaluation. For the purposes of cost-effectiveness analysis of DSM programs and measures, administrative costs are applied at the level of program cost-effectiveness analysis and do not enter into the screening of individual DSM measures. Costs included in the screening of individual DSM measures are limited to customer incremental or installed costs. This distinction is made in the application of costs because administrative costs are incurred at the program level and may be allocated arbitrarily, or may not be distributed uniformly across individual DSM measures and applications.

Thus, for program level cost-effectiveness screening the following formulation of the SCT applies:

$$BCR_{SC,\ PROGRAM} = (UAC + NMB) \div (PRC + PC_N + UIC)$$

However, for cost-effectiveness screening at the individual measure level the administrative cost term is omitted and the following formulation applies:

$$BCR_{SC,\ MEASURE} = (UAC + NMB) \div (PC_N + UIC)$$

D. Non-Market Benefits (NMB)

The SCT allows for the inclusion of 'non-market benefits and costs to society'[3] Non-market benefits includes items such as reliability benefits (e.g. avoided blackouts as the result of less strain on distribution systems), non-energy benefits (e.g. secondary economic impacts from low income programs), fuels diversity benefits (e.g. potential to reduce risks of supply disruption or mitigating the effects of price volatility). In addition, the non-market benefits included in the SCT test are intended to value the broader societal benefits from avoided environmental externalities such as avoided pollution or reduced risk of climate change. This viewpoint differs from the inclusion of the potential financial risks of CO_2 emissions discussed previously in that it also considers a broader societal perspective[4]. If non-market benefits are used in the SCT for measure or program evaluations they will be indentified and defined.

E. Net Participant Costs (PC_N)

- The net participant costs typically include all equipment costs, installation, operation and maintenance, cost of removal (less salvage value) paid by participants.
- The majority of participant costs are typically the incremental costs or full installed costs incurred by customers in the process of installing the DSM measure. The term 'net' implies that all relevant customer costs are included in this value, and generally includes either one of two types of costs;
    1. 'Incremental costs' that are the difference in cost between a standard efficiency and high efficiency device. Incremental costs are typically used when a device has failed and is going to be replaced anyway ('replace on burn-out'), or in the case of new construction projects.

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[3] Decision No. 71436, R14-2-2401 Definitions, Page 4.

[4] The societal discount rate is a reflection of a society's relative valuation on today's well-being versus well-being in the future. Choices about the SDR of environmental protection projects, such as funding the reduction of global warming, place a greater valuation on future generations, employing a low time preference that places more emphasis than average on their well-being in the further future.

2. 'Full installed costs' that are typically defined as the cost of replacing a working system with a higher-efficiency system. In general full installed costs include both the full cost of the material being installed and also the cost of the labor to install the measure.

- All incremental costs, including other expenses such as additional costs for designing a more efficient building, will be considered on a case by case basis as part of the measure screening process.
- Net participant costs will be updated and reported through the MER process.

IV. Summary of Key Recommendations

Key recommendations in the white paper include;

1. Avoided cost of energy will be stated as levelized costs and will be developed using the assumptions for the forecasted marginal production costs included in the integrated resource planning (IRP) model, with adjustments as appropriate for the impacts of the energy savings planned through the energy efficiency standard.
2. Until such time that the financial and legislative impacts of carbon mitigation are developed, the marginal production costs for energy will include an estimated cost of carbon that is imbedded in the marginal production cost of energy included in the IRP filed by each individual utility. As the IRP Rule sets forth, any interested party may provide, for the Commission's consideration, analyses and supporting data pertaining to environmental impacts.
3. Avoided cost of generation capacity will be stated as annual levelized costs based primarily on the cost of the next marginal unit identified in the IRP generation plan. Utilities may also use an approach that combines the next marginal unit cost and the cost of short term market capacity where appropriate.
4. The avoided cost of generation capacity will include the value of both principal and interest payments over the term of the debt incurred in installing these resources.
5. A societal discount rate will be used that will be based on the yield for U.S. Treasury securities up to a cap of 4%.
6. Administrative costs for energy efficiency measures will be applied at the level of program cost-effectiveness analysis and do not enter into the screening of individual DSM measures. Individual measure screening will be based on savings and measure incremental costs only.
7. The net-to-gross ratio will be assigned a value of 1 in cases where free ridership, spillover, and market influence effects cannot be measured or estimated with a reasonable degree of confidence.

Glossary of Terms

The factors included in the formulas above are further defined as follows.

- **Avoided Costs**: the generation, transmission, distribution, and fuel costs that that the utility avoids making though investing in DSM resources.
- **Free ridership: program** participants who would have installed DSM measures anyway without the influence of the program.
- **Gross demand savings:** DSM measure demand savings at the customer meter not including NTG effects (i.e., whether the measure installation was caused by the program isn't considered).
- **Gross energy savings:** DSM measure energy savings at the customer meter not including NTG effects (i.e., whether the measure installation was caused by the program isn't considered).

- **Levelized Costs:** the process of calculating levelized costs involves taking a string of costs and calculating a uniform annual cost value over the duration of the measure life. This reduces the curve to a single, levelized cost that can be used in a present value calculation. This is referred to in this memo as the levelized cost model. Levelized costs can potentially hide the volatility of fossil fuel prices (and perhaps other costs) and that, consequently, the hedge value of stably-priced energy efficiency is neglected.
- **Net demand savings:** the amount of demand savings at the generator actually attributable to the DSM program including line loss factor, capacity reserve factor and NTG effects.
- **Net energy savings:** the amount of energy savings at the generator actually attributable to the DSM program including line loss factor and NTG effects.
- **Net-to-gross ratio:** net savings/gross savings.
- **Non-market benefits**: benefits to society or reduced environmental emissions and other non-energy benefits that are not recovered through utility rates.
- **Program administrator program costs:** all non-incentive costs required to operate and deliver the program including management, administration, marketing, implementation services and measurement and evaluation.
- **Spillover:** customers who installed DSM measures due to the influence of a DSM program but did not participate in the program. This effect includes both **internal** and **external spillover**. **Internal spillover** is typically defined as other measures installed in the same facility, while **external spillover** is typically defined as measures installed in other related facilities.

EXHIBIT 2

CLEAN

UniSourceEnergy SERVICES

UNS Electric, Inc.
Rider R-2
Demand Side Management Surcharge (DSMS)

APPLICABILITY

The Demand Side Management Surcharge (DSMS) applies to all customers, except customers who take service under the Customer Assistance Residential Energy Support (C.A.R.E.S) pricing plan or Low income Medical Life Support Program (C.A.R.E.S.-M) pricing plan in all territory served by UNS Electric, Inc. as mandated by the Arizona Corporation Commission, unless otherwise specified. C.A.R.E.S. and C.A.R.E.S.-M customers are exempt from any DSM surcharge.

RATE

The following DSM Surcharge is effective June 1, 2011 through December 31, 2012. The DSMS shall be applied to all monthly net bills except for C.A.R.E.S. customer at the following rate:

All kWh @ $0.003350 per kWh

REQUIREMENTS

The UNS Electric, Inc. DSMS will be calculated and filed with the Arizona Corporation Commission (ACC) for approval on or before June 1. The ACC will approve the surcharge to be billed to all applicable pricing plans for twelve (12) months beginning each January 1.

TAX CLAUSE

To the charges computed under the above rate, including any adjustments, shall be added the applicable proportionate part of any taxes or governmental impositions which are or may in the future be assessed on the basis of gross revenues of the Company, and/or the price of, or revenue from, gas sales or service sold and/or the volume of gas sales generated or purchased for sale and/or sold hereunder.

RULES AND REGULATIONS

The standard Rules and Regulations of the Company as on file from time to time with the Arizona Corporation Commission shall apply where not inconsistent with this pricing plan.

REDLINE

UniSourceEnergy SERVICES

UNS Electric, Inc.
Rider R-2
Demand Side Management Surcharge (DSMS)

APPLICABILITY

The Demand Side Management Surcharge (DSMS) applies to all customers, except customers who take service under the Customer Assistance Residential Energy Support (C.A.R.E.S) pricing plan or Low income Medical Life Support Program (C.A.R.E.S.-M) pricing plan in all territory served by UNS Electric, Inc. as mandated by the Arizona Corporation Commission, unless otherwise specified. C.A.R.E.S. and C.A.R.E.S.-M customers are exempt from any DSM surcharge. ~~s effective July 1, 2009.~~

RATE

The following DSM Surcharge is effective June 1, 2011 through December 31, 2012. The DSMS shall be applied to all monthly net bills except for C.A.R.E.S. customer at the following rate:

All kWh @ $0.00335~~00995~~ per kWh

REQUIREMENTS

The UNS Electric, Inc. DSMS will be calculated and filed with the Arizona Corporation Commission (ACC) for approval on or before ~~April~~June ~~1st~~. The ACC will approve the surcharge to be billed to all applicable pricing plans for twelve (12) months beginning each ~~June~~January 1.

TAX CLAUSE

To the charges computed under the above rate, including any adjustments, shall be added the applicable proportionate part of any taxes or governmental impositions which are or may in the future be assessed on the basis of gross revenues of the Company, and/or the price of, or revenue from, gas sales or service sold and/or the volume of gas sales generated or purchased for sale and/or sold hereunder.

RULES AND REGULATIONS

The standard Rules and Regulations of the Company as on file from time to time with the Arizona Corporation Commission shall apply where not inconsistent with this pricing plan.

EXHIBIT 3

Exhibit 3 – DSMS Backup

Table 1: 2010 Expenditures and 2011-2012 Proposed Budgets

DSM Support Programs	2010 Expenditures	2010 Approved Budgets	2011 Budget	2012 Budget	Combined 2011-2012 Budget
Education and Outreach	$56,171	$127,308	$141,822	$141,884	**$283,706**
Residential Energy Financing	NA	NA	$425,853	$426,606	**$852,459**
Codes Support	NA	NA	$22,174	$29,278	**$51,452**
Support Programs Subtotal	$56,171	$127,308	$589,849	$597,768	**$1,187,617**
Behavioral Programs					
Home Energy Reports	NA	NA	$209,150	$312,933	**$522,083**
Behavioral Comprehensive Program	NA	NA	$309,683	$518,716	**$828,399**
Behavioral Subtotal	$0	$0	$518,833	$831,649	**$1,350,482**
Residential Efficiency Programs					
Low-Income Weatherization	$123,707	$111,395	$351,433	$351,817	**$703,250**
Appliance Recycling	NA	NA	$225,011	$225,249	**$450,260**
Residential New Construction	$152,723	$445,578	$359,084	$411,454	**$770,538**
Existing Home (was Efficient Home Cooling)	$85,459	$318,270	$1,156,567	$1,554,402	**$2,710,969**
Shade Tree Program	$21,758	$65,000	$47,965	$60,433	**$108,398**
Efficient Products (CFL)	$327,004	$350,200	$558,208	$766,185	**$1,324,393**
Multi-Family Direct Install	NA	NA	NA	$81,300	**$81,300**
Residential Subtotal	$710,651	$1,290,443	$2,698,268	$3,450,840	**$6,149,108**
Non-Residential Efficiency Programs					
Bid For Efficiency	NA	NA	$147,087	$323,583	**$470,670**
C&I Facilities	$449,931	$424,360	$1,497,435	$2,058,880	**$3,556,315**
C&I Schools Program	NA	NA	$161,402	$197,645	**$359,047**
Retro-Commissioning	NA	NA	NA	$256,352	**$256,352**
Non-Residential Subtotal	$449,931	$424,360	$1,805,924	$2,836,460	**$4,642,384**
Program Totals	**$1,216,753**	**$1,842,111**	**$5,612,874**	**$7,716,717**	**$13,329,591**
Program Development, Analysis & Reporting Software[1]	$241,128	NA	$216,000	$222,480	**$438,480**
Baseline Study	$127,362	$142,000	NA	NA	**NA**
Sub-total	**$368,490**	**$142,000**	**$216,000**	**$222,480**	**$438,480**
Total[2]	**$1,585,243**	**$1,984,111**	**$5,828,874**	**$7,939,197**	**$13,768,071**

1. Expenses are necessary for compliance and reporting reqirements of EEES.

2. 2010 Expenditures are preliminary. Final 2010 Expenditures will be reported in the Semi-annual report due April 1, 2011.

Table 2: DSMS Rate Calculation

UNSE	DSM Budget	19MoForecast	Rate/kWh
Total Expense	$13,768,071	4,775,244,697	**$0.002883**
Performance Incentive	$2,231,343	4,775,244,697	**$0.000467**
	$15,999,414		**$0.003350**

APPENDIX A:

UNS Electric Appliance Recycling Program

Program Description

UNS Electric, Inc. ("UNS Electric") Appliance Recycling Program ("Program") is designed to remove and responsibly recycle inefficient but operable refrigerators or freezers from the power grid which are currently being used as secondary appliances or potentially could become secondary units. The Program will offer residential customers a $35 incentive, free pick-up, and free recycling of their inefficient refrigerators or freezers. The Program will utilize an experienced appliance recycling contractor to market the Program, verify customer's eligibility, coordinate and process incentives, schedule and pick-up eligible appliances, and responsibly recycle the appliances. UNS Electric believes this Program will reduce energy consumption in its service territory and help keep inefficient appliances out of the used appliance market. The approach utilized by this Program has been successfully implemented in many other states and UNS Electric believes it will be successful in its service territory.

Program Objectives and Rationale

The objective of the Program is to permanently remove operable inefficient refrigerators and freezers from the power grid and recycle them in an environmentally safe manner. This will produce long-term electric energy savings in UNS Electric's residential sector.

The Program's rationale is to incent customers with a $35 rebate, free pick-up, and responsible recycling of their operable inefficient refrigerators and freezers. The Program will provide the consumers with an energy savings alternative to selling or donating these inefficient units to the used appliance market or utilizing the unit themselves. Additionally it saves consumers the burden of disposing of the appliance and the $35 municipal fee required to do so.

Table 1-1. Market Barriers and Program Elements

Market Barrier	Program Element
• Lack of awareness about operating costs for older inefficient refrigerators and freezers • Inconvenience of removing old units. • Cost of disposal. • Environmental impact of disposal.	• Marketing materials with operating cost estimates. • Free pick-up/removal from customer site plus incentive. • Free disposal. • Using an environmentally responsible recycling contractor for disposal.

Target Market

The Program is targeted at residential customers who are currently operating inefficient refrigerators and/or freezers in their homes, or may be considering selling, donating or keeping a recently acquired inefficient unit as a secondary appliance.

Program Eligibility

The Program is available to all residential utility customers with operable inefficient refrigerators or freezers that are between 10 and 30 cubic feet. The Program will limit the rebate to two units per year per household.

Current Baseline Conditions

National studies have found that approximately 20% of customers have at least one secondary inefficient refrigerator or freezer in their home. Most of these units are ten years old or more.

Products and Services

The products and services provided by the Program include:

- free pick-up and recycling of operable inefficient refrigerators or freezers;
- a $35 customer incentive;
- education and promotional efforts to inform customers about the energy saving benefits of recycling their older inefficient refrigerators or freezers, including brochures, promotional material, and utility website content;
- refrigerator and freezer recycling in accordance with established U.S. Environmental Protection Agency ("EPA") best practice industry standards to ensure optimal levels of recycled material and environmental compliance;
- working with retailers to distribute information about the Program and the energy saving benefits of recycling inefficient refrigerators and freezers;
- removal and proper disposal of the chlorofluorocarbons ("CFCs") (a potent greenhouse gas used as a blowing agent in older foam insulation products) contained in many older appliances - a significant additional environmental benefit of the program; and
- customer outreach achieved when the recycling contractor leaves behind additional literature and information about other energy efficiency Demand-Side Management ("DSM") programs and opportunities.

Delivery Strategy, Incentive Processing, and Administration

The strategy for Program delivery, incentive processing, and administration is as follows:

- Turnkey appliance pick-up/recycling: an implementation contractor will be selected to provide comprehensive turnkey implementation services, from eligibility verification and scheduling of pick-ups, to proper disposal and recycling of turned-in appliances.

- Incentive coordination and processing: the implementation contractor will coordinate prompt processing of incentive payments. A prompt incentive payment is essential to retailer/customer satisfaction, thus the implementation contractor will establish protocols and service level requirements that expedite payment.

Implementation-related administrative requirements will be handled by the third-party implementation contractor. The implementation contractor will be responsible for:

- management of the scheduling, pick-up, and appliance recycling processes;
- marketing strategy and messaging;
- development and placement of promotional materials and advertising;
- incentive processing;
- data tracking and reporting;
- investment tracking and reporting;
- contact (call) center services;

- managing public relations; and
- customer satisfaction/problem resolution.

The Program will use marketing messages targeted at customers with inefficient refrigerators/freezers. Mass marketing will emphasize the cost of operating inefficient refrigerators/freezers and the environmental benefits of proper disposal. The Program will be marketed at retail point-of-sale providing retailers with a responsible disposal service for those customers replacing their current inefficient refrigerator or freezer.

Program Marketing and Communication Strategy

The marketing and communications strategy will include but is not limited to the following components:

- Direct marketing to customers on the savings benefits of removing and recycling an inefficient refrigerator or freezer on the utility website and with bill inserts.
- A Web site link to the EPA's new "ENERGY STAR® Recycle My Old Fridge Campaign" at http://www.energystar.gov/index.cfm?c=recycle.pr_refrigerators, which includes calculators to estimate savings.
- Media advertising which may include local newspapers or other selected print media, press releases, radio and/or television.
- Information provided through UNS Electric's Customer Care Center.
- Marketing materials which may include brochures and other collateral pieces to promote the benefits and energy savings of recycling an inefficient refrigerator/freezer. UNS Electric will also design a thank you note and leave behind materials describing other residential and small business programs available to customers.

All marketing materials will carry a strong consumer education message emphasizing the cost of operating an inefficient refrigerator or freezer and the importance of properly recycling and disposal of older units. Marketing materials will also leverage the ENERGY STAR® brand and the savings associated with purchasing ENERGY STAR® appliances.

Program Implementation Schedule

Upon Program approval by the Arizona Corporation Commission ("Commission"), UNS Electric's plans to immediately engage an implementation contractor selected through a request for proposals ("RFP") process to deliver the Program. UNS Electric's goal is to recycle a total of 1,150 units per year for 2011, 2012, and 2013 respectively.

Measurement, Evaluation, and Research Plan

All evaluation activities will be conducted by UNS Electric's measurement, evaluation, and research ("MER") contractor. An integrated evaluation approach will be taken that includes the following components:

- addressing evaluation at the onset of Program design and collecting evaluation data as part of Program administration;
- assessing and documenting baseline conditions;
- establishing tracking metrics;

- developing and refining deemed savings measure databases; and
- conducting primary and secondary research as part of the impact and process evaluations.

The overall goal of the impact evaluation will be to validate/calibrate the deemed savings values of the Program, and to determine its cost-effectiveness. Primary impact metrics are savings per unit, Program participants, net-to-gross ratio, and Program cost-effectiveness.

Validation/calibration of deemed savings values will be determined by an analysis of Program records and by testing a sample of equipment picked up for recycling. Primary research may be conducted to determine the impact of variables such as size of refrigerator, effective life of the equipment, and owner utilization. Self-report surveys with both participants and non-participants will be used to assess Program awareness, barriers to participation, participant satisfaction, and other process efficiency issues. Interviews will also be conducted with Program managers and the implementation contractor. These surveys will be enhanced by collecting market data and assessing trends.

The process evaluation will be conducted during the first Program year and then coordinated with impact evaluation work. Wherever it is practical and appropriate, evaluation activities will be conducted in conjunction with other utilities and agencies in the state to efficiently utilize resources and help ensure consistency.

Quality Assurance and Control

- Refrigerators and freezers will be checked for functionality before removal as only operating units will be picked up.
- Only operable inefficient refrigerators and freezers will be picked up.
- All refrigerators will be decommissioned by the implementation contractor, or accredited third party, in accordance with applicable local state and federal standards for proper handling of refrigerants.
- Customer satisfaction surveys will be sent to a random sample of customers.
- All Program data tracking will be performed by the Program implementer and reported to the utility monthly.
- The Program evaluation process (described above) will provide an additional level of quality assurance for the Program.

Program Costs and Benefits

Proposed budget for Program delivery for 2011-2012 is detailed in Table 1-3.

Table 1-2. Measure Savings, Incentive Level, and Participation, Benefit-Cost

Measure	Annual Energy Savings (kWh) /Unit	Peak Demand Savings (kW)/ Unit	Avg. Incentive / Unit	Unit Basis	2011 Units	2012 Units	Measure Level Societal Test Result
Refrigerator Recycling	1,242	0.15	$35	Per Unit	1,035	1,035	4.0
Freezer	942	0.11	$35	Per Unit	115	115	3.1

Recycling

Table 1-3. Program Budgets

	Incentives	Program Delivery	Program Marketing	Utility Program Administration	Evaluation	Total Program Cost	Lifetime Net Benefits ($)	Program Level Societal Cost Test
2011	$40,250	$153,787	$19,404	$2,915	$8,654	$225,011	$220,724	1.7
2012	$40,250	$153,916	$19,417	$3,003	$8,663	$225,249	$220,486	1.7

Table 1-4. Environmental Benefits

	Annual CO2 Savings (Metric Tons)	Annual NOx Savings (Metric Tons)	Annual SOx Savings (Metric Tons)	Lifetime CO2 Savings (Metric Tons)	Lifetime NOx Savings (Metric Tons)	Lifetime SOx Savings (Metric Tons)
2011	626	0.09	0.00	3,759	0.52	0.02
2012	626	0.09	0.00	3,759	0.52	0.02

Measure Analysis Sheets

Appliance Recycling Program

Incentive Calculations
Appliance Recycling Program (Residential)
Remove Existing Secondary Refrigerator or Freezer

PROGRAM DATA	
Measure Life (yrs)*:	6
Program Life (yrs):	5
Demand AC ($/kW):	$72.41
Summer On-pk Energy AC ($/kWh):	$0.09
Summer Off-pk Energy AC ($/kWh):	$0.05
Winter On-pk Energy AC ($/kWh):	$0.06
Winter Off-pk Energy AC ($/kWh):	$0.04
Administrative Cost ($/unit)	$182.43
Discount Rate:	9.02%
Societal Discount Rate:	4.00%
Refrigerator NTG Ratio	100%
Freezer NTG Ratio	100%

RATE DATA	
Rate:	
$/kW:	0.00
$/kWh, On-Peak:	$0.11
$/kWh, Off-Peak:	$0.11

OPERATING DATA	
On-Pk Op. Hours:	50%
Off-Pk Op. Hours:	50%
Summer Ratio:	50%
Winter Ratio:	50%
Hourly Load Factor:	4%
In-Service Rate	100%
Coincidence Factor	100%

OTHER FACTORS	
Line Loss Factor - Demand:	9.5%
Line Loss Factor - Energy:	9.5%
Capacity Reserve Factor:	0%
Application	Removal
Cost Basis:	Removal

DEMAND/ENERGY SAVINGS						INCENTIVE CALCULATIONS						CUSTOMER COST/ SAVINGS				WGT.	%Incent	Societal
Unit Type	Annual Energy Savings (KWh)	Non-Coincident Demand Savings (KW)	Coincident Demand Savings (KW)	On-pk Energy Savings (KWh)	Off-pk Energy Savings (KWh)	IRP PV Benefit ($)	Societal PV Benefit ($)	Recommended Incentive ($)	Recommended Incentive %PV	PV Program Cost ($)	NPV ($)	Incr. Cost** ($)	Cost Savings ($)	Payback wo/ Inc. (yrs)	Payback w/ Inc. (yrs)	Weighting Factor	(%)	BC Ratio
Refrigerator	1,242	0.142	0.142	621	621	408	477	35	9%	302	106	120	136	0.9	0.62	90%	29%	1.6
Freezer	942	0.108	0.108	471	471	310	362	35	11%	302	7	120	103	1.2	0.82	10%	29%	1.2
Combined		0.138	0.138	606	606	398	466	35	9%	302	96	120	133	0.9	0.64	100%	29%	1.5
Weighted Average Check		OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK

*Kema, "Residential Refrigerator Recycling Ninth Year Retention Study", Study ID's 546B, 563; prepared for SCE, 7/22/2004; available from Calmac web site as study # SCE0130.01
**Based on IC cost of picking up refrigerator/ freezer.

File Name: ApplianceRecycling_MAS_Res_UNSE_2011_01_12

APPENDIX B:

UNS Electric Residential Energy Efficiency Financing Pilot Program

Program Description

UNS Electric, Inc. ("UNS Electric" or "Company") has designed a proposed Energy Efficiency Residential Financing Pilot Program ("Program") to provide customers with the capital needed to make cost-effective energy efficiency upgrades to their homes. UNS Electric believes that a two year pilot program will allow sufficient time for the Company to evaluate the Program, including participation, default rates, and overall value to customers. UNS Electric's proposed Program elements include:

- Loan commitment of $1,000,000 per year for two years; this will provide approximately 208 loans based on an average $4,818 loan amount;
- Loans available only on energy efficiency measures meeting the Commission-required cost-effectiveness test;
- Low interest rates provided by a combination of an interest rate buy-down and a 10% loan loss reserve account;
- Limited customer exposure to default risk (10% of the loan commitment);
- Funding provided through an approved demand-side management ("DSM") surcharge charged to residential customers;
- Affordable residential financing for energy efficiency measures;
- Convenient customer access to and repayment of the financing;
- Standard finance product offering for all eligible, approved borrowers;
- Leveraged financing;
- Accurate Truth-in-Lending notifications and billing to customers provided by an experienced third party lender; and
- Community involvement in forming and marketing the Program.

UNS Electric also requests Commission direction on the level of impact for residential customers. Depending on the Commission direction, UNS Electric proposes to increase the DSM Surcharge residential customers by one of three levels during the first year of the two year pilot program.

- $1,000,000 in funding with no interest rate buy-down would require $0.0003per kWh to fund the Program. The average annual cost to each residential customer would be $3.49;
- $1,000,000 in funding with a 2% interest rate buy-down would require $0.0005 per kWh to fund the Program. The average annual cost to each residential customer would be $4.91;
- $1,000,000 in funding with a 3% interest rate buy-down would require $0.0005 per kWh to fund the Program. The average annual cost to each residential customer would be $5.59.

Of note, UNS Gas, Inc. ("UNS Gas") (a related entity to UNS Electric), requested a program nearly identical to the one requested herein for UNS Electric. The UNS Gas program was approved in ACC Decision No. 72062 (January 6, 2011). In that decision, the Commission opted for the 2% interest rate buy-down option. Based on that decision, UNS Electric recommends the 2% buy-down option, yet provides throughout this application all three buy-down options for the Commission's consideration.

The second year surcharge for the Program is expected to decrease slightly as the second year costs for the program will be lower. Details are shown in section 1.17, Table 1-6 below.

Program Objectives and Rationale

UNS Electric believes that the Program's financing options to help cover the costs of energy efficiency measures will improve customer participation in energy efficiency programs and expand the pool of customers that can afford to participate in those programs. Although other vendors offer financing for their own individual products, the Program's comprehensive approach to home energy upgrades cuts across several potential products and includes efficiency measures not traditionally financed, such as air and duct sealing.

Prior to designing the Program, UNS Electric developed key objectives for the Company's implementation of a financing program. Three objectives stood out from the rest as fundamental in order for UNS Electric to provide a financing option:

- The program design must eliminate the utility from any Truth-in-Lending Law regulation implications;
- The program must provide a reasonable amount of funds at a reasonable interest rate and with a low initial investment; and
- Energy efficiency measures that qualify for UNS Electric financing must have met the Commission's cost-effectiveness test.

With these objectives, UNS Electric hired Harcourt Brown Energy and Finance ("Harcourt Brown") to assist with the evaluation, negotiations, and design of the Program. UNS Electric, with guidance from Harcourt Brown, selected a Third Party Financing model secured by a combination of a 10% loan loss reserve account and an interest rate buy-down, all funded from the DSM Surcharge, as the best program offering.

Target Market

The target market for this Program is any residential customer in UNS Electric's service territory who owns their home. Financing is available for installation of approved and cost effective DSM energy efficiency measures.

Program Eligibility

Eligible properties include single-family (1 to 4 unit), owner-occupied homes.

Current Baseline Conditions

The primary program available for comparison is offered through Fannie Mae. Fannie Mae utilizes an unsecured loan program structured in a similar manner to UNS Electric's. Fannie Mae's base interest rate is 14.99% compared to the 7.99% to 9.99% available through the UNS Electric Program. The programs offered by Arizona Public Service and Southwest Gas Company are expected to have base interest rates of 6.5% to 8.5%.

Products and Services

Harcourt Brown evaluated the following parameters before recommending the most beneficial program to UNS Electric:

- sources of capital;
- interest rates;
- loan terms;
- loan types and amounts;
- risk management;
- program integration;
- ease of use;
- repayment billing; and
- equitable funding.

UNS Electric and Harcourt Brown considered several financing models and completed discussions with numerous entities nationwide before determining the most beneficial financing model for customers. The model selected by UNS Electric uses AFC First ("AFC" or "Lender") as the third party lender. Capital resources are provided by the Pennsylvania Treasury ("PA Treasury") with loans leveraged by a loss reserve account as well as the possibility of a small interest rate buy-down. All funding will be provided by a DSM Surcharge applied to residential customers of UNS Electric.

The Program will offer energy efficiency loans to UNS Electric customers who are seeking financing for the energy efficiency improvements to their homes. Loan proceeds can be used for energy efficiency measures that have been approved by the Commission.

The Program is designed to provide an equitable and comprehensive approach to the financing of energy efficiency improvements in existing homes. UNS Electric is proposing $2,000,000 in overall loan commitments to this Program for two consecutive years as a pilot program. UNS Electric believes the size of this loan commitment is sufficient based on the number of customers in its service territory and the limited DSM energy efficiency measures available.
UNS Electric evaluated the customer impact of three levels of funding, as shown in

Table 1-1 below. UNS Electric assumed an average loan size of $4,818 and a maximum term of 12 years in these calculations. Actual amounts will vary by loan size and terms.

Table 1-1. Funding Levels and Cost to Customer

UNS Electric - Impact of Residential Financing Program with Buy-Down Options (Res Only) - Year 1					
Total Loan Amount Available (ResRate 10 Only)	*Estimated # of Loans	DSM Funding for Reserve (10%)	Buy-Down Percentage	**DSM Funding for Buy-Down	Total Program Budget (Year 1)
$1,000,000	208	$100,000	0%	$ -	$277,248
$1,000,000	208	$100,000	2%	$112,705	$389,952
$1,000,000	208	$100,000	3%	$166,670	$443,918

UNS Electric - Impact of Residential Financing Program with Buy-Down Options (Res Only) - Year 2					
Total Loan Amount Available (ResRate 10 Only)	*Estimated # of Loans	DSM Funding for Reserve (10%)	Buy-Down Percentage	**DSM Funding for Buy-Down	***Total Program Budget (Year 2)
$1,000,000	208	$100,000	0%	$ -	$235,367
$1,000,000	208	$100,000	2%	$112,705	$348,072
$1,000,000	208	$100,000	3%	$166,670	$402,038

* Assumes average loan size $4,818

** Assumes maximum 12 year term

*** Year 2 Costs reduced due to lower cost for marketing materials and contractor training

Total 2-Year DSM Budget		
No Buydown	$	512,615
2% Buydown	$	738,025
3% Buydown	$	845,955

Note: UNS Electric proposes that the DSM Surcharge necessary to fund this program be collected only from residential customers, as the loan instruments described are restricted to residential customers.

Table 1-2. Cost to Customer – Buy Down Options

UNS Electric - Impact of Residential Financing Program with Buy-Down Options (Res Only)					
Total Program Budget	Actual kWh 2009 (Less Lifeline Residential)	Adjustor Increase/ kWh	Total # of Customers EOY 2009 (Less Lifeline)	Average kWh per Customer	Average Annual Cost
$ 277,248	813,795,407	$ 0.0003	79,483	10,239	$ 3.49
$ 389,952	813,795,407	$ 0.0005	79,483	10,239	$ 4.91
$ 443,918	813,795,407	$ 0.0005	79,483	10,239	$ 5.59

Program Funding and Terms

The proposed Program operates as follows:

1. AFC will be the Lender that originates and services the Program loans. AFC has committed to make loans according to basic underwriting terms, including approving borrowers with a Fair Isaac Corporation ("FICO") credit score of 640 or higher. Borrowers may be granted up to 12 years repayment; though interest rates are currently to be determined, UNS Electric has secured a verbal commitment that rates will be between 7.99% and 9.99%. Interest rates will not vary due to loan size, term, or credit score and there will be no prepayment penalty.
2. Additional terms will be contractually delineated between AFC and UNS Electric. Final rates and availability will be determined prior to program commencement.
3. PA Treasury will contract with AFC to purchase the Program loans from AFC. The interest rates, loan terms, underwriting criteria and other relevant characteristics of the loans that PA Treasury will purchase will be contractually delineated. Final rates and availability will be determined by October 1, 2010.

4. UNS Electric will set aside funds through a loan loss reserve account (10% of committed loan value) and/or an interest rate buy-down account. The loss reserve agreement will be negotiated with the PA Treasury.
5. AFC's loan capital will be replenished from the proceeds of UNS Electric's sale of Program loans to the PA Treasury, thereby enabling AFC to make new loans.
6. The PA Treasury will sell the Program loans to its investors. The proceeds from these sales will enable the PA Treasury to make additional loan purchases from AFC.
7. UNS Electric's role in this process will be to provide the loan loss reserve account, to support lending, and potentially to buy-down interest rates. Funding will be collected through the DSM Surcharge from UNS Electric residential customers. UNS Electric will not service or originate the loans.

Interest Rate Buy-down

The interest rate buy-down referenced above may be necessary to offer a rate competitive with those rates offered in other utility financing programs in the State. The programs offered by Arizona Public Service and Southwest Gas Company have interest rates ranging from 6.5% to 8.5%. Because the interest rate buy-down will result in an additional cost that will be covered through the DSM Surcharge, UNS Electric seeks Commission guidance on the final product offering. As previously stated, UNS Electric recommends the 2% buy-down option based on the Commission's decision in the UNS Gas Residential Energy Efficiency Financing Pilot Program (ACC Decision No. 72062 (January 6, 2011) , yet provides the data for all three options for the Commission's consideration in this matter. The cost of the interest rate buy-down will depend on (1) the market interest rate, (2) the target interest rate, (3) the loan amounts, and (4) the loan term. Table 1-3 illustrates two potential scenarios regarding the interest rate buy-down cost on a per-loan basis. The interest rate buy-down costs will be in addition to the costs shown in **Error! Reference source not found.** above.

Table 1-3. Interest Rate Buy-Down Costs

Average Loan Size of $4,818		
Buydown %	**7-Year Term**	**12-Year Term**
2%	322	$543
3%	479	$803

Loan Terms

UNS Electric has worked with many lenders to develop the best loan terms for its customers. Optimal repayment terms, interest rates, fees, and application processes have been at the forefront of discussions. However, UNS Electric cannot dictate to any lender the package of terms they must offer. The terms must be negotiated and beneficial to both the lender and the customer, and meet various standards set forth by bank regulators. The loan terms available under the Program are as follows:

Table 1-4. Loan Terms, Rates and Payment Range

Financing Amount	Terms	Interest Rates	Payment Range on $4,818.00 Ave. Loan
$1,000 - $15,000 w/o Buydown	up to 144 Mos.	7.99% - 9.99%	$52 - $58
$1,000 - $15,000 w/2% Buydown	up to 144 Mos.	5.99% - 7.99%	$47 - $52
$1,000 - $15,000 w/3% Buydown	up to 144 Mos.	4.99% - 6.99%	$45 - $50

As demonstrated in Table 1-4, the payment amount based on the estimated average loan size does not fluctuate greatly between an interest rate of 4.99% and 9.99% ($45 to $58 per month). As the loan size increases to the maximum ($15,000), the payment spread widens from $139 per month to $179 per month at these same rates. UNS Electric is looking for guidance from the Commission to decide whether or not the benefit of the payment savings to these individual customers offsets the buy-down fee charged to all residential customers. As with other DSM Programs, low-income customers will be excluded from the DSM Surcharge.

Credit Underwriting

Limited credit standards will be used by the Lender in its underwriting process. Loan approval is granted based on FICO credit scores of 640 and above, debt-to-income ratios of 50% or less, and proof of income. These lower credit scores allow far greater participation for UNS Electric residential customers than products offered by most other lenders.

Application and Approval Process

The application and approval process is designed to be simple, easily accessible and convenient to all, as shown on the following page.

- Customers can call a 1-800 telephone number to apply and receive loan approval; or
- Applications can be filled out during the visit with the contractor; or
- Loan applications will be available on the UNS Electric website; and
- Loan approvals will occur within 20 minutes to 48 hours of making the application.

With the help of community-action groups as well as contractor marketing and UNS Electric marketing, the Company believes that Program loan funds will be fully used each year. At this time, the only approved residential energy efficiency measures for the UNS Electric territory are the high-efficiency air conditioner and heat pump exchange, duct sealing, air sealing, ceiling insulation and window film/shade screens. The anticipated participation discussed herein is based on the assumed participation in the Existing Homes Program approved by the Commission in Decision No. 72024 (December 10, 2010).
While loan sizes are likely to vary, UNS Electric estimates that 620customers will choose to participate in the Existing Homes Program. UNS Electric further estimates that only a percentage of those participants will install each energy efficiency measure. Details of the UNS Electric methodology to determine the average loan size are demonstrated in Table 1-5. With the $1,000,000 loan commitment each year available through the Program, approximately 208 loans could be made in the service territory assuming an average loan size of $4,818. If the average loan size is smaller than this estimate, the number of loans will increase proportionately.

Table 1-5. Determination of Average Loan Size

UNS ELECTRIC ESTIMATE OF LOAN SIZE					
Participants	620				
Category	Annual kWh	%	Total Lost kWh	Estimated Cost of Measure	Total Financing Requirement
Duct Seal	1,233	60%	458,676	$935	$347,820
Air Seal	410	40%	101,680	$370	$91,760
Insul & Air Seal	1,112	30%	206,832	$1,165	$216,690
Equipment & Ducts	1,703	40%	422,344	$7,939	$1,968,872
Shade Screens	1,202	60%	447,144	$708	$263,376
Attic Insulation Only	702	20%	87,048	$ 795	$98,580
TOTALS			1,723,724		$2,987,098
Average Loan Size per Customer					$4,818

Delivery Strategy, Incentive Processing and Administration

The strategy for Program delivery and administration is as follows:

- Coordination between the Lender and UNS Electric on all fund transfers will be managed in-house by a single UNS Electric Program Manager;
- The Program Manager will also provide overall management, marketing oversight, planning and tracking of customer and contractor participation; and
- The Program Manager will coordinate all activities necessary to develop application forms and contractor training.

Key partnering relationships will include:

- Community interest groups;
- HVAC, insulation, and air sealing contractors trained in Program procedures; and
- The Arizona Energy Office, community colleges, or other industry experts to provide training, education and awareness.

The Program will use contractors initially recruited for the Existing Homes Program, encouraging them to promote UNS Electric financing when working with customers. UNS Electric will provide an orientation of the Program which will outline Program requirements and contractors responsibilities as well as discuss reporting and data collection procedures. Contractors interested in participating in the Program must attend the orientation.

Program Marketing and Communication Strategy

UNS Electric will provide Program marketing and customer outreach and awareness through a range of strategies including:

- Promotions on the UNS Electric website about the benefits of purchasing high-efficiency equipment and home performance measures;
- Promotion through contractors and through community interest groups;

- Providing information through UNS Electric's customer care center;
- Developing marketing pieces including brochures and other collateral pieces to promote the benefits of qualifying equipment, air sealing and duct sealing, and the financing program available to fund those measures; and
- Training and seminars for participating trade allies and contractors.

The advertising campaign will communicate that high-efficiency systems and home performance measures will help reduce customer energy bills, provide equal or better comfort conditions, and are beneficial for the environment.

Program Implementation Schedule

The PA Treasury has assured Harcourt Brown that funding for the Program is available. UNS Electric will continue working with AFC and the PA Treasury on preparation of contracts, agreements, and other documents as we await Commission approval. UNS Electric estimates the Program could commence within 30 to 60 days of receiving Commission approval.

Measurement, Evaluation and Research Plan

UNS Electric will adopt an integrated data collection strategy designed to provide a quality data resource for Program tracking, management, and evaluation. This approach will entail the following primary activities:

- Database management: As part of Program operation, UNS Electric will request the Lender to provide the necessary data elements to populate the tracking database and provide periodic reporting; and
- Data collection: UNS Electric will establish systems to collect the data needed to support effective Program management, transfer of funds from UNS Electric to the loan loss reserve accounts, reporting, and evaluation.

Quality Assurance and Control

Due to the risks inherent with this type of program, quality assurance and control will be a daily function of the Program Manager. In order to protect its customer's interests, UNS Electric plans to collect loan information prior to and after each loan closing, as it believes the best time to correct a mistake or avoid fraud is prior to the loan being funded. The information collected will not be used by UNS Electric to approve the credit-worthiness of a borrower, but will be reviewed to: 1) ensure that each loan falls within what has been approved by the Commission; 2) that Commission-approved measures are the only items being financed by the loan; and 3) that the loan proceeds are for work being performed by an approved contractor. Additionally, each signed Promissory Note and Disbursement Sheet along with a copy of the disbursement check will be collected to verify the loan was closed and funded as presented to UNS Electric.

Additional steps to keep a tight control on the portfolio are the requirements of daily, weekly and monthly reporting. Daily reporting will include daily viewing access to the Loan Loss Reserve Account, and notification of any defaults and charge offs. Lender will also provide UNS Electric a past-due report on a weekly basis. Monthly reporting will be more extensive, with a full portfolio report provided to UNS Electric. The monthly portfolio report will include the information UNS Electric will need for accurate reporting and control of the Program. A monthly reconciled statement for the Loan Loss Reserve Account will also be required.

Program Costs and Benefits

Three possible budgets are detailed in Table 1-6. Potential budgets depend on whether or not a buy-down approach is used. An estimate of lost revenue resulting from installation of energy efficiency measures installed as a result of the Program has been included as a component of the Annual Budget.

Table 1-6. Two Year Pilot Program Budget

ALL CALCULATIONS ASSUME AVERAGE LOAN SIZE $4,722 AND TERMS 12 YEARS			
Description at $1,000,000 Loan Commitment - 0% Buy-Down	**2011**	**2012**	**Total**
Loan Loss Reserve Amount	$100,000	$100,000	$200,000
DSM Funds for Interest Buy-Down	$ 0	$ 0	$ 0
Loss Default Recovery Expected 2023 @ 3% of 2011 commitment	$ 0	$ 0	$ 0
UNS Electric Internal Administration 1/3 FTE	$22,434	$23,107	$45,541
Reporting	$9,659	$9,949	$19,608
Marketing Materials	$52,843	$25,000	$77,843
Joint Utility Coordination Transfers	$50,000	$50,000	$100,000
Contractor Training Classes	$25,000	$10,000	$35,000
UNS Electric Loss Revenue Recovery	$17,312	$17,312	$34,623
Budget Total	**$ 277,248**	**$ 235,367**	**$512,6155**
Includes Estimated Lost Revenue for $1,000,000 Residential Loans			

Description at $1,000,000 Loan Commitment - 2% Buy-Down	**2011**	**2012**	**Total**
Loan Loss Reserve Amount	$100,000	$100,000	$200,000
DSM Funds for Interest Buy-Down	$112,705	$112,705	$225,409
Loss Default Recovery Expected 2023 @ 3% of 2011 commitment	$ 0	$ -	$ -
UNS Electric Internal Administration 1/3 FTE	$22,434	$23,107	$45,541
Reporting	$9,659	$9,949	$19,608
Marketing Materials	$52,843	$25,000	$77,843
Joint Utility Coordination Transfers	$50,000	$50,000	$100,000
Contractor Training Classes	$25,000	$10,000	$35,000
UNS Electric Loss Revenue Recovery	$17,312	$17,312	$34,623
Budget Total	**$389,952**	**$348,072**	**$738,025**
Includes Estimated Lost Revenue for $1,000,000 Residential Loans			

Appendix B

Description at $1,000,000 Loan Commitment - 3% Buy-Down	2011	2012	Total
Loan Loss Reserve Amount	$100,000	$100,000	$200,000
DSM Funds for Interest Buy-Down	$166,670	$166,670	$333,340
Loss Default Recovery Expected 2023 @ 3% of 2011 commitment	$ 0	$ -	$ -
UNS Electric Internal Administration 1/3 FTE	$22,434	$23,107	$45,541
Reporting	$9,659	$9,949	$19,608
Marketing Materials	$52,843	$25,000	$77,843
Joint Utility Coordination Transfers	$50,000	$50,000	100,000
Contractor Training Classes	$25,000	$10,000	$35,000
UNS Electric Loss Revenue Recovery	$17,312	$17,312	$34,623
Budget Total	**$443,918**	**$402,038**	**$845,955**
Includes Estimated Lost Revenue for $1,000,000 Residential Loans			

Upon maturity of the first set of loans (maximum of 12 years into the Program), the amount collected through the DSM surcharge for the next year will be reduced. At that point, the loan loss reserve account associated with the loans from the first year will be returned to the Program. The amount returned will equal the initial amount funded into the loan loss reserve account, plus interest accrued on the account, less any loan losses sustained.

There is no direct benefit or savings from a residential financing program, but the total DSM Portfolio Cost for UNS Electric will increase as a result of offering the Program. However the indirect benefit and savings is measured at the program level where individual energy efficiency measures are included. UNS Electric believes the availability of financing for the Existing Homes Program will increase participation, and thus increase the resulting societal benefits and savings reported in the program.

To compare the estimated annual savings to the estimated annual payments for the three buy-down scenarios (no buy-down, 2% buy-down and 3% buy-down) UNS Electric provided examples of the customer benefit and savings from two likely scenarios from participation in the Existing Homes Program. This information is included in Table 1-7. As set forth in Example 1 of Table 1-7 anticipated savings would be less than estimated loan payments using a 2% or 3% buy-down. However, Example 2 demonstrates that with a lower loan size, the savings would be greater than the annual loan payments. This example demonstrates how the Program could result in cost savings to some customers, but that UNS Electric cannot guarantee cost savings to all customers.

According to Commission Staff, societal cost tests are not applicable to a residential financing program.

Table 1-7. Examples of Estimated Savings, Costs and Payments

Category	Annual kWh Savings	Annual Customer Savings $0.10/kWh	Estimated Job Cost
Duct Seal	1233	$123	$935
Air Seal	410	$41	$370
Insul & Air Seal	1112	$111	$1,165
Equipment & Ducts	1703	$170	$7,700
Shade Screens	1202	$120	$708
Attic Insulation Only	702	$70	$795
TOTALS			

Example 1:

Customer Chooses Envelope AND Efficient Equipment	Annual kWh Savings	Annual Customer Savings @$0.10/kWh	Estimated Job Cost	Annual Pmt 12 Year 0%	Annual Pmt 12 Year 2%	Annual Pmt 12 Year 3%
Equipment & Ducts	1,703	$170	$7,700			
Insulation & Air Sealing	1,112	$111	$1,165			
Totals	2,815	$282	$8,865	$1,271	$1,151	$1,093

Example 2:

Customer Chooses Envelope AND Efficient Equipment	Annual kWh Savings	Annual Customer Savings @$0.10/kWh	Estimated Job Cost	Annual Pmt 12 Year 0%	Annual Pmt 12 Year 2%	Annual Pmt 12 Year 3%
Duct Sealing Only	1,233	$123	$935			
Insulation & Air Sealing	1,112	$111	$1,165			
Totals	2,105	$211	$2,100	$301	$273	$259

APPENDIX C:

UNS Electric Energy Codes Enhancement Program

Program Description

Building energy codes are widely recognized as a relatively simple, cost-effective means of achieving substantial energy savings that will accrue over the lifetime of new and renovated buildings. However, barriers to the effective implementation of improved building energy codes in Arizona exist. UNS Electric, Inc. ("UNS Electric") believes the Energy Codes Enhancement Program ("ECEP") will reduce energy consumption in its service territory and help improve compliance with existing building energy codes.

Program Objectives and Rationale

The objective of the Program is to increase energy savings in new construction and renovated buildings in both the residential and commercial sectors through efforts to: 1) improve levels of compliance with existing building energy codes, and 2) support and inform periodic energy code updates as warranted by changing market conditions.

As a "home rule" state, building codes vary greatly across local jurisdictions. Many code officials lack the time, knowledge and resources necessary to effectively enforce existing codes, and to stay current on market trends that may warrant gradual code updates over time. These challenges are particularly pronounced during current economic conditions. Building design and construction professionals also may be confused about certain code requirements and could likely benefit from additional education and training.

In jurisdictions that currently lack a building code of any sort, public officials could benefit from information and assistance in developing and advocating the adoption of a building code.

Following is a list of the primary barriers in this market and the program elements addressing those barriers:

Table 1-1. Market Barriers and Program Elements

Market Barrier	Program Element
▪ Lack of knowledge and resources to facilitate compliance with existing codes ▪ Inconsistency in codes across the state ▪ Lack of resources to advocate for adoption of new codes	▪ Participation on committees and collaboration with relevant stakeholders to promote exchange of information ▪ Trainings for code officials and the building community ▪ Advocacy in support of adopting new codes, as appropriate

Target Market

Program staff will collaborate with: 1) local entities responsible for energy code compliance and enforcement, and approving code changes (e.g., public officials, committees, city councils, etc.), and 2) regional and national organizations that track market trends and can inform provide insight into best practices for energy code improvements and enforcement. Trainings to promote code compliance would target local code officials, building design professionals (e.g., engineers, architects and specifiers, builders and contractors.)

Program Eligibility

A calculation methodology to apportion energy savings attribution from energy codes will be developed that satisfies the Arizona Corporation Commission ("Commission") requirements.[1]

Current Baseline Conditions

Arizona is a "home rule" state with no mandatory state-wide energy efficiency code. However, many counties and cities have adopted an energy efficiency code, most often the 2006 International Energy Conservation Code ("IECC").

Products and Services

The ECEP will strive to maximize energy savings through adherence to local building energy codes across the local jurisdictions within the utility service area. The program will employ a variety of tactics aimed at: 1) improving levels of compliance with existing building energy codes, and 2) supporting and informing periodic updates to energy codes as warranted by changing market conditions. Specific program activities will depend on the market needs expressed by local code officials. Activities are likely to include a combination of efforts to:

- Better prepare code officials and building professionals to adhere to existing standards;
- Provide data and market insight to document the specific local benefits of code enforcement, and inform energy code changes over time;
- Ensure utility incentive programs align well with local energy codes;
- Collaborate with relevant stakeholders to help build a more robust community working to advance strong and effective building energy codes across the local jurisdictions within UNS Electric and UNS Gas, Inc.;
- Advocate for energy code updates over time.

Delivery Strategy, Incentive Processing and Administration

Program activities will be selected based on research into effective approaches implemented in leading jurisdictions (e.g., California and Massachusetts), as well as feedback from local code officials, and municipal leaders in locations that currently lack building codes. Once program activities are selected, program staff will maintain a consistent level of activity and engagement with relevant stakeholders.

Key elements of the implementation strategy may include:

- Supporting local energy code adoption through participation in energy code adoption committees for both minimum energy code requirements, and voluntary "stretch codes" (such as LEED and other sustainable/green codes
- Providing technical support to code adoption committees (e.g., benefit cost analysis of potential code updates, research and information sharing related to the market penetration of particular energy efficient technologies)
- Providing public testimony in support of code adoption before city councils
- Ensuring that ongoing DSM programs align well with energy code requirements

[1] Arizona Corporation Commission; Docket No. RE-00000C-09-0427, Decision No. 71436 issued December 16, 2009, p. 8.

- Providing funding and / or other resources to better equip local code agencies to enforce and improve energy code compliance over time. Program staff may select a set of jurisdictions to receive a higher level of assistance on an annual basis. This will help increase the level of impact on those target communities with a high likelihood for producing the greatest amount of incremental savings. Support provided to these target jurisdictions may include activities such as:
  - classroom training sessions for code officials, and building professionals (architects, engineers, specifiers, builders and contractors)
  - brown bag training sessions for code officials, and building professionals a their places of business via a circuit rider
  - field training sessions for code officials and building professionals
  - purchasing energy code books for officials that currently lack such resources
  - supporting energy code-related certifications for code officials
  - conducting energy code compliance assessments by 2017 to fulfill ARRA requirements to demonstrate 90% energy code compliance (this could be done in coordination with energy efficiency program MER activities)
  - Collaborating with the Southwest Energy Efficiency Project ("SWEEP") and other regional groups to support research on and adoption of building codes and equipment standards.

UNS Electric staff will be responsible for administering the program. Staff required to implement the program include one-quarter of a full-time-equivalent ("FTE") staff person at a middle management level, and one-quarter FTE junior staff person. Responsibilities for these staff will include coordination, planning and implementation of all program activities. Measurement, evaluation and research ("MER") activities would be conducted by a third-party contractor.

Program Marketing and Communication Strategy

Key elements of the marketing strategy will include:

- Direct outreach to local code officials and to other local officials drawing on industry association contact lists (e.g., the International Code Council), and networks of municipal leaders.
- Participation in committees conducting activities related to building code enhancement.
- Communications with other UNS Electric energy efficiency program implementation staff in order to cross-market across programs.
- Easy-to-locate information posted on UNS Electric's website.

Program Implementation Schedule

Upon Program approval by the Commission, UNS Electric plans to immediately engage stakeholders in assessing energy code requirements and compliance status, as well as indentifying best avenues for energy code enhancement throughout the service territory.

Measurement, Evaluation, and Research Plan

All evaluation activities will be conducted by UNS Electric's MER contractor. An integrated evaluation approach will be taken that includes the following components:

- addressing evaluation at the onset of Program design and collecting evaluation data as part of Program administration;
- assessing and documenting baseline conditions;
- establishing tracking metrics, especially baseline energy code compliance per major local jurisdiction;
- developing and refining deemed savings methodologies for estimating program savings from energy code enhancement and adoption activities; and
- conducting primary and secondary research as part of the impact and process evaluations.

The overall goal of the impact evaluation will be to develop savings methodologies for estimating savings from more stringent energy code adoption and increased energy code compliance rates in both the residential and commercial sectors.

Process related evaluation activities will review utility energy code promotion implementation strategies and seek to identify ways to improve program delivery and market adoption of more aggressive residential and commercial energy codes. Self-report surveys with key stakeholders (code officials, builders, architects, etc.) as well as on-site verification of a sample of new construction projects will be used to assess program awareness, barriers to participation, participant satisfaction, and other process efficiency issues. Interviews will also be conducted with Program managers and the implementation contractor. These surveys will be enhanced by collecting market data and assessing trends. Wherever it is practical and appropriate, evaluation activities will be conducted in conjunction with other utilities and agencies in the state to efficiently utilize resources and help ensure consistency.

Quality Assurance and Control

- The energy codes enhancement program will seek to be an additional informational resource to assist code officials, architects, engineers, builders, contractors, and other stakeholders with technical guidance with respect to energy code adoption and compliance activities.
- Utility staff will seek to further strengthen existing contacts with code officials, architects, engineers, builders, contractors, and other stakeholders to advance energy code upgrades and greater levels of energy code compliance, which will include occasional on-site verification visits, especially for those projects receiving utility incentives for efficiency upgrades.
- For any utility sponsored energy code training classes, participant satisfaction surveys will be issued as a standard feature of the class.
- All Program data tracking will be performed by the Program implementer and reported to the utility monthly.
- The Program evaluation process (described above) will provide an additional level of quality assurance for the Program.

Program Costs and Benefits

Table 1-2. Program Budgets

	Incentives	Program Delivery	Program Marketing	Utility Program Administration	Evaluation	Total Program Cost	Lifetime Net Benefits ($)	Program Level Societal Cost Test
2011	$0	$18,540	$2,781	$0	$853	$22,174	0	N/A
2012	$0	$23,044	$3,457	$1,652	$1,126	$29,278	0	N/A

Energy savings from this program will be determined after the impact evaluation is approved and completed. The overall goal of the impact evaluation will be to develop savings methodologies for estimating savings from more stringent code adoption and increased code compliance rates in both the residential and commercial sectors.

APPENDIX D:

UNS Electric Multifamily Housing Efficiency Program

Program Description

Multifamily housing has traditionally been a difficult sector to reach for utility Demand-Side Management ("DSM") programs. These buildings represent huge efficiency potential and also substantial barriers to implementation. The major barriers include split incentives, lack of capital, and lack of knowledge/awareness of the benefits of energy efficiency improvements. Further complicating matters, multifamily housing is defined differently by different by different entities. Properties with 2-4 dwelling units typically fall under residential financing guidelines and the decisions makers are usually individuals. Larger properties with 5 dwelling units or more typically fall under commercial lending guidelines and decision-makers (at least for larger complexes) are typically corporate, institutional, or trusts (e.g., Real Estate Investment Trusts). As such, the decision making process and access to capital varies between these two market segments. With this distinction in mind, the 2-4 unit market segment can be best served by the residential Home Performance with ENERGY STAR® Program, and the 5+ Multifamily Housing market segment will be served by the new commercial Multifamily Efficiency Program.

In order to encourage energy efficiency upgrades in new construction, major renovation and rehabilitation projects, as well as, energy efficiency retrofits of existing structures, the program will initially offer the following delivery tracks:

- A direct installation of selected low cost energy efficiency improvements in existing complexes.
- Common area energy efficiency improvements in existing complexes will be handled through the Small Business Direct Install Existing Facilities Program.

As the program develops and matures, UNS Electric, Inc. ("UNS Electric") will examine a third track for encouraging more comprehensive dwelling unit energy efficiency improvements in existing complexes that are not part of major renovation/rehabilitation projects.

With these delivery options to choose from property owners and managers have a variety of solutions to fit their needs.

Program Objectives and Rationale

Other utilities around the country are offering energy efficiency programs in an effort to capture some of the savings potential in the multifamily housing market including San Diego Gas and Electric, Southern California Edison, Pacific Gas and Electric, Austin Energy, Puget Sound Energy and others. Many of these programs offer similar incentives and delivery options to the program proposed by UNS Electric, and the major renovation/rehabilitation track is well aligned with the ENERGY STAR® Multifamily Homes program. By delivering this program with a focus on reducing key market barriers and targeting key decision makers, this program can contribute significantly to the achievement of UNS Electric's DSM program energy savings goals by lowering energy usage in multifamily housing complexes.

The objectives of the program are to:

- Reduce peak demand and overall energy consumption in the multifamily housing market segment
- Promote energy efficiency retrofits of both dwelling units and common areas in this market segment
- Increase overall awareness about the importance and benefits of energy efficiency improvements to the landlord and property ownership community
- Help meet the energy savings targets of the UNS Electric DSM program portfolio

Target Market

The Multifamily Housing Efficiency Program will be promoted to residential rental properties with five or more units. The focus of marketing, outreach and incentives will be the property owners or managers. A primary emphasis will be placed on larger and older, less efficient complexes. This program is being designed to mimic the UNS Electric program as many of the large rental property owners are the same in Phoenix as in Tucson

Program Eligibility

All existing multifamily housing complexes and new construction projects within UNS Electric service territory with 5 dwelling units or more are eligible for the program. The program promotes energy efficiency improvements in both dwelling units and common areas. Eligible projects include new construction, acquisition renovation and rehabilitation projects, and energy efficiency retrofits to existing facilities. Eligible facilities include apartment complexes, and common areas of apartment and condominium complexes. All UNS Electric customers who are property owners of existing residential multifamily complexes or developers of new complexes with five or more dwelling units are eligible for the program.

Current Baseline Conditions

The energy efficiency potential in the multifamily housing market remains largely untapped and represents significant efficiency potential for the UNS Electric program portfolio. Due to various market barriers, such as split incentives, capital constraints, and lack of awareness, energy efficiency improvements typically fall far below other types of improvements on the priority list. Thus, multifamily housing units are often very energy inefficient. Although the current rebate programs offer some opportunities for energy efficiency improvements in this market, primarily through the Efficient Products and Residential HVAC Programs, there is not a comprehensive offering that addresses the unique needs of this market. Through the direct installation, and renovation/rehabilitation implementation framework, this program seeks to fill this important gap in the UNS Electric program portfolio and provide substantial energy savings.

Products and Services

This program will be delivered a direct installation approach in order to encourage energy efficiency upgrades in existing complexes:

- Delivery to be through a direct installation effort, focusing on the implementation of CFL lighting, faucet aerators, and low flow showerheads in existing dwelling units. The installation will be no cost to the owner, and the program will pay the full cost of product installation. The installation can be completed either through the facility's existing maintenance or management personnel or via a program authorized installation contractor. Common area energy efficiency improvements in existing complexes will be handled through the Solutions For Business Existing Facilities Program.

As the program develops and matures, UNS Electric will examine a third track for encouraging more comprehensive dwelling unit energy efficiency improvements in existing complexes that are not part of major renovation/rehabilitation projects.

Program Marketing and Communication Strategy

Marketing and communications strategies will include notifying apartment managers and owners through updates to website; local newspapers and radio; bill messages and bill inserts; training seminars; call center on-hold messages; direct mail promotion; outreach to rental housing industry associations; and work with contractors and industry specialists.

Program Implementation Schedule

To be implemented beginning in 2012.

Delivery Strategy Incentive Processing, and Administration

The direct installation and rehabilitation/new construction components of the program will be delivered by an implementation contractor. Installation contractors will be managed and quality assurance will be maintained by the implementation contractor.

Measurement Evaluation and Research Plan

The Measurement, evaluation, and research ("MER") team will develop a MER research plan and conduct annual evaluation research on the achievements of this program.

Quality Assurance and Control

On-site inspections of at least 10% of all participating facilities will be made by the implementation contractors.

Program Costs and Benefits

Table 1-1. Measure Savings, Incentive Level, and Participation, Benefit-Cost

Measure	Annual Energy Savings (kWh) /Unit	Peak Demand Savings (kW)/ Unit	Avg. Incentive / Unit	Unit Basis	2011 Units	2012 Units	Measure Level Societal Test Result
ES Integral CFL	139	0.00	$2	Per bulb	-	4,000	31.6
Low Flow Showerheads – Electric Only	320	0.03	$40	Per Shower	-	400	5.1
Faucet Aerators – Electric Only	90	0.01	$2	Per Faucet	-	400	25.6

Table 1-2. Program Budgets

	Incentives	Program Delivery	Program Marketing	Utility Program Administration	Evaluation	Total Program Cost	Lifetime Net Benefits ($)	Program Level Societal Cost Test
2011	$0	$0	$0	$0	$0	$0	$0	N/A
2012	$26,178	$42,158	$6,834	$3,003	$3,127	$81,300	$235,199	3.9

Table 1-3. Environmental Benefits

	Annual CO_2 Savings (Metric Tons)	Annual NO_x Savings (Metric Tons)	Annual SO_x Savings (Metric Tons)	Lifetime CO_2 Savings (Metric Tons)	Lifetime NO_x Savings (Metric Tons)	Lifetime SO_x Savings (Metric Tons)
2011	-	-	-	-	-	-
2012	334	0.05	0.00	2,296	0.32	0.01

Resources

1. San Diego Gas and Electric- http://www.sdge.com/documents/residential/2009applicationmultifamily.pdf

2. Southern California Edison - http://www.sce.com/NR/rdonlyres/49780CB4-30CB-4E03-9DF0-586B0AD6DEDF/0/2009_MultifamilyRebateApp.pdf

3. Southern California Edison. Multifamily Energy Efficiency Rebate Program. Program 2502, 2006.

4. Pacific Gas and Electric Company- http://www.pge.com/includes/docs/pdfs/shared/saveenergymoney/rebates/08_residential_appliance.pdf

5. U.S. EPS ENERGY STAR® Program - http://www.energystar.gov/index.cfm?c=multifam_housing.bus_multifam_housing

6. Austin Energy - http://www.austinenergy.com/Energy%20Efficiency/Programs/Rebates/Commercial/Multi-Family%20Properties/index.htm

7. *Puget Sound Energy* http://www.pse.com/solutions/forbusiness/Pages/comMulifamilyWeather.aspx

Measure Analysis Sheets

Incentive Calculations

Multi-Family DI

Energy Efficient Aerators

PROGRAM DATA	
Kitchen Faucet Aerator Measure Life*:	10
Bathroom Kitchen Faucet Aerator Measure Life*:	10
Program Life (yrs):	5
Kitchen Faucet Aerator Demand AC ($/ kW):	$64.51
Kitchen Faucet Aerator Summer On-pk Energy AC ($/ kWh):	$0.08
Kitchen Faucet Aerator Summer Off-pk Energy AC ($/ kWh):	$0.06
Kitchen Faucet Aerator Winter On-pk Energy AC ($/ kWh):	$0.07
Kitchen Faucet Aerator Winter Off-pk Energy AC ($/ kWh):	$0.06
Bathroom Faucet Aerator Demand AC ($/ kW):	$64.51
Bathroom Faucet Aerator Summer On-pk Energy AC ($/ kWh):	$0.08
Bathroom Faucet Aerator Summer Off-pk Energy AC ($/ kWh):	$0.06
Bathroom Faucet Aerator Winter On-pk Energy AC ($/ kWh):	$0.07
Bathroom Faucet Aerator Winter Off-pk Energy AC ($/ kWh):	$0.06
Kitchen Faucet Aerator Gas AC ($/ therm):	$0.78
Bathroom Faucet Aerator Gas AC ($/ therm):	$0.78
Administrative Cost:	NA
Discount Rate:	9.02%
Societal Discount Rate:	4.00%
NTG Ratio:	100%

RATE DATA	
Rate:	
$/ kW:	$0.00
$/ kWh, On-Peak:	$0.11
$/ kWh, Off-Peak:	$0.11

OPERATING DATA	
Faucet Aerator On-Pk Op. Ratio:	30%
Faucet Aerator Off-Pk Op. Ratio:	70%
Summer Ratio:	50%
Winter Ratio:	50%
Faucet Aerator Coincidence Factor:	80%

OTHER FACTORS	
Line Loss Factor - Demand:	9.5%
Line Loss Factor - Energy:	9.5%
Capacity Reserve Margin:	0%
Application	Retrofit
Cost Basis:	Full Install

	DEMAND/ ENERGY SAVINGS						INCENTIVE CALCULATIONS						CUSTOMER COST/ SAVINGS				WGT.	% Incent	Societal
	Annual Energy Savings	Non Coin Demand Savings	Coincident Demand Savings	On-pk Energy Savings	Off-pk Energy Savings	Gas Energy Savings	IRP PV Benefit	Societal PV Benefit	Recommended Incentive**		PV Program Cost	NPV	Incr. Cost	Cost Savings	Payback wo/ Inc.	Payback w/ Inc.	Weighting Factors		
Unit Type	(KWh)	(kW)	(KW)	(KWh)	(KWh)	(Therms)	($)	($)	($)	%PV	($)	($)	($)	($)	(yrs)	(yrs)	(%)	(%)	BC Ratio
1.5 GPM Kitchen Faucet Aerator	117	0.024	0.019	35	82	0	63	80	2	4%	2	61	2	12.87	0.2	0.00	50%	100%	32.9
1.5 GPM Bathroom Faucet Aerator	63	0.013	0.010	19	44	0	34	43	2	7%	2	32	2	6.93	0.3	0.00	50%	100%	17.7
Weighted Average	90	0.018	0.015	27	63	0	48	61	2	5%	2	46	2	9.90	0.3	0.00	100%	100%	25.3

*DEER 2008.

**Incentive based on 2011 UES Program Planning.

File Name: Aerators_MAS_MultiFamily_UNSE_2010_12_09

Appendix D

Incentive Calculations
ES Integral CFL

Multi-Family DI

PROGRAM DATA	
Measure Life (yrs)**:	6
Program Life (yrs):	5
Demand AC ($/kW):	57.31
Summer On-pk Energy AC ($/kWh):	0.07
Summer Off-pk Energy AC ($/kWh):	0.05
Winter On-pk Energy AC ($/kWh):	0.06
Winter Off-pk Energy AC ($/kWh):	0.06
Program Admin. Costs ($/bulb):	NA
Discount Rate:	9.02%
Social Discount Rate:	4.00%
NTG Ratio:	100%

RATE DATA	
Rate:	
$/kW:	0.00
$/kWh, On-Peak:	0.11
$/kWh, Off-Peak:	0.11

OPERATING DATA	
On-Pk Op. Hours:	1,657
Off-Pk Op. Hours:	1,215
Total Hours:	2,872
Summer Ratio:	50%
Winter Ratio:	50%
Coincidence Factor***:	0.08
HVAC Interaction Factor (Demand)*:	0.20
HVAC Interaction Factor (Energy)*:	0.17

OTHER FACTORS	
Line Loss Factor-Demand:	9.5%
Line Loss Factor-Energy:	9.5%
Capacity Reserve Factor:	0%
Application	RET
Cost Basis:	Full Installed

	DEMAND/ ENERGY SAVINGS						INCENTIVE CALCULATIONS						CUSTOMER COST/ SAVINGS				WGT.	%Incent	Societal
Fixture Type	Inc. Fixture Watts	CFL Fixture Watts	Non-Coincident Demand Savings (KW)	Coincident Demand Savings (KW)	On-pk Energy Savings (KWh)	Off-pk Energy Savings (KWh)	IRP PV Benefit ($)	Social PV Benefit ($)	Recommended Incentive** ($)	Recommended Incentive** %PV	PV Program Cost ($)	NPV ($)	Incr. Cost ($)	Cost Savings ($)	Payback wo/ Inc. (yrs)	Payback w/ Inc. (yrs)	Weighting Factor	(%)	BC Ratio
Screw In	40	9	0.028	0.002	45	33	24	28	2	8%	2	22	2	9	0.2	0.0	14%	100%	15.4
	60	14	0.041	0.003	67	49	36	42	2	6%	2	34	2	13	0.2	0.0	19%	100%	19.3
	60	15	0.041	0.003	65	48	35	41	2	6%	2	33	2	12	0.2	0.0	10%	100%	18.9
	75	18	0.051	0.004	83	61	45	52	3	6%	3	42	3	16	0.2	0.0	3%	100%	19.7
	75	20	0.050	0.004	80	59	43	50	3	6%	3	40	3	15	0.2	0.0	11%	100%	19.0
	100	23	0.069	0.006	112	82	60	70	2	4%	2	58	2	21	0.1	0.0	10%	100%	28.8
	100	26	0.067	0.005	108	79	58	68	2	4%	2	55	2	20	0.1	0.0	2%	100%	27.7
	100	27	0.066	0.005	106	78	57	67	2	4%	2	55	2	20	0.1	0.0	32%	100%	27.3
Weighted Average			0.052	0.004	83	61	45	52	2	5%	2	42	2	16	0.16	0.00	100%	100%	22.7
Weighted Average Check			OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK

*HVAC Interaction Factors based on 2010 MER Report.
**Measure Life and Incentive based on 2011 UES Program Planning.
***Coincidence Factor based on Building America Performance Analysis and Navigant Load Shape study.

File Name: ScrewInCFL_MAS_MultiFamily_UNSE_2011_01_12

Appendix D

Incentive Calculations
Energy Efficient Showerheads

Multi-Family DI

PROGRAM DATA	
Showerhead Measure Life*:	10
Program Life (yrs):	5
Showerhead Demand AC ($/ kW):	$64.51
Showerhead Summer On-pk Energy AC ($/ kWh):	$0.08
Showerhead Summer Off-pk Energy AC ($/ kWh):	$0.06
Showerhead Winter On-pk Energy AC ($/ kWh):	$0.07
Showerhead Winter Off-pk Energy AC ($/ kWh):	$0.06
Showerhead Gas AC ($/ therm):	$0.78
Administrative Cost:	NA
Discount Rate:	9.02%
Societal Discount Rate:	4.00%
NTG Ratio:	100%

RATE DATA	
Rate:	
$/ kW:	0.00
$/ kWh, On-Peak:	$0.11
$/ kWh, Off-Peak:	$0.11

OPERATING DATA	
Showerhead On-Pk Op. Ratio:	20%
Showerhead Off-Pk Op. Ratio:	80%
Summer Ratio:	50%
Winter Ratio:	50%
Showerhead Coincidence Factor:	31%

OTHER FACTORS	
Line Loss Factor - Demand:	9.5%
Line Loss Factor - Energy:	9.5%
Capacity Reserve Margin:	0%
Application	Retrofit
Cost Basis:	Full Install

	DEMAND/ ENERGY SAVINGS						INCENTIVE CALCULATIONS						CUSTOMER COST/ SAVINGS				WGT.	%Incent	Societal
Unit Type	Annual Energy Savings (KWh)	Non Coin Demand Savings (kW)	Coincident Demand Savings (KW)	On-pk Energy Savings (KWh)	Off-pk Energy Savings (KWh)	Gas Energy Savings (Therms)	IRP PV Benefit ($)	Societal PV Benefit ($)	Recommended Incentive** ($)	Recommended Incentive** %PV	PV Program Cost ($)	NPV ($)	Incr. Cost ($)	Cost Savings ($)	Payback wo/ Inc. (yrs)	Payback w/ Inc. (yrs)	Weighting Factors (%)	(%)	BC Ratio
1.5 GPM Showerhead	320	0.103	0.032	62	258	0	159	201	40	25%	40	119	40	35.09	1.1	0.00	100%	100%	5.0
Weighted Average	320	0.103	0.032	62	258	0	159	201	40	25%	40	119	40	35.09	1.1	0.00	100%	100%	5.0

*DEER 2008.
**Incentive based on 2011 UES Program Planning.

File Name: Showerheads_MAS_MultiFamily_UNSE_2010_12_09

APPENDIX E:

UNS Electric Bid for Efficiency Pilot Program

Program Description

UNS Electric, Inc.'s ("UNS Electric" or "Company") Bid for Efficiency Pilot Program ("Pilot" or "Program") is designed to take an innovative approach to energy efficiency ("EE") by using elements of competition and the potential for high rewards to enhance customer interest. The Bid for Efficiency ("BFE") concept involves the following: 1) customers or project sponsors develop projects aimed at aggregating savings ; 2) applicants submit bids identifying projected energy savings and specifying the requested incentive in $/kWh; 3) UNS Electric selects winning applicants based on specified criteria. The BFE concept is an innovative approach that is being successfully deployed in other jurisdictions. There are several market specific conditions that will determine the effectiveness for UNS Electric and so UNS Electric is proposing the BFE as a two year pilot program.

BFE participants and project sponsors may include commercial customers, ESCOs or other aggregators who organize proposals that involve multiple sites. The Pilot addresses customer market barriers such as small savings levels at multiple sites, longer payback periods and organizing implementation contractors ("IC") and it offers a simplified application process. Results will be verified through Measurement and Verification ("M&V") activity.

Program Objectives and Rationale

BFE encourages customers and project sponsors to think holistically regarding energy systems, and to develop projects designed to optimize system energy use rather than considering the energy usage of each individual piece of equipment. Customers or project sponsors develop their project and then bid competitively for incentives within broad program guidelines developed by UNS Electric.

By encouraging a systems approach to energy efficiency, the Pilot would provide an incentive for participants to use potentially multiple EE approaches at one or several sites simultaneously. UNS Electric will encourage customers to think outside the box in submitting bids for EE projects.
UNS Electric's implementation goals for the Program are as follows:

- Ensure projects are submitted, approved, implemented and verified in a timely manner;
- Allow each project to be customer-driven; responsibility will be placed on customer (or project sponsor) to select appropriate trade and professional allies to design and implement the project and to prepare the incentive application;
- Encourage implementation of multi-measures for comprehensive projects; and
- Encourage aggregated applications that involve implementation at multiple sites.

Target Market

Initially, the Pilot's outreach will focus on market segments with significant savings potential, unique load or energy savings characteristics, and those that require specialized delivery or support services. The target market consists primarily of larger customers and customer groups that may include grocery stores, convenience stores, or data centers, business sectors that have historically been hard to reach.

Electric loads may be aggregated among multiple facilities to meet the kWh threshold. The minimum target electric energy reduction amount per proposal is 200,000 kWh in first-year savings.

Program Eligibility

Any entity, customer, or project sponsor meeting the application requirements of achieving the minimum target electric energy reduction amount per proposal of 200,000 kWh in first-year savings may participate. Eligible project sponsors may include, but are not limited to UNS Electric customers, Energy Service Companies, and engineering firms. Any third-party project sponsor must submit their application with the consent and support of the indentified UNS Electric customer.

To provide participants maximum flexibility in identifying potential projects, the Program will not explicitly specify eligible measures. However, measures must meet the following requirements:

- Produce a measurable and verifiable reduction in energy consumption;
- Produce savings through an increase in energy efficiency or better utilization of energy through improved production equipment or controls;
- Be installed in a retrofit application;
- Have a useful life of five years or greater; and
- Prove cost-effective using the Societal Cost Test (applies to total project including all measures).

Examples of eligible measures are listed in the following table. Project sponsors are free to propose measures not included in the table, as long as the above requirements are met.

Table 1-1. Examples of Potentially-Eligible Measures

• Replacing motors with NEMA Premium® efficiency motors
• Variable-speed drive installations
• Lighting system upgrades
• Compressed air system improvements
• Energy management and control systems
• HVAC system improvements
• Chiller and refrigeration system improvements
• Heat recovery systems
• Efficient transformers
• Process changes that improve energy efficiency
• Industrial heat pumps
• Control upgrades resulting in improved energy efficiency

Current Baseline Conditions

Programs similar to the one proposed have been offered by other utilities including Mid-American Company, Iowa; San Diego Gas & Electric, California; WPPI Energy, Wisconsin; and Xcel Energy, Colorado and Minnesota. Experiences of those utilities to date indicate that the BIF concept has a high degree of effectiveness in producing energy savings.

Products and Services

The key "product" offered by the Program is a performance-based incentive offered to winning bidders. UNS Electric will market the Program to customers and trade allies and will select winning bidders on a quarterly basis. UNS Electric will provide pre- and post-installation metering. The sequence of implementation activities is presented in the following section.

Delivery Strategy, Incentive Processing, and Administration

The following implementation process is proposed for the program:

1. UNS Electric, and or its IC, will advertise Bid for Efficiency Pilot to customers and trade allies.
2. Customers/trade allies will submit bids for their EE projects.
3. UNS Electric/IC will evaluate projects and make awards.
4. UNS Electric/IC will perform pre-installation metering.
5. Customer will implement proposed project.
6. UNS Electric will pay 50% of the incentive amount prior to installation.
7. UNS Electric/IC will perform post-installation metering.
8. UNS Electric will pay the remaining incentive amount based on actual M&V energy savings (based on first year of operation).

Program Marketing and Communication Strategy

UNS Electric will promote the Bid for Efficiency Pilot Program through direct promotion to key customers and aggregators. UNS Electric, and/or its IC, also may conduct informational meetings with potential participants and project sponsors to explain the program rules and encourage participation.

Initially, program outreach will be focused on market segments with significant savings potential, unique load or energy savings characteristics and the need for specialized delivery or support services including:

- Grocery stores
- Convenience stores
- Data centers

Program Implementation Schedule

UNS Electric proposes to implement the Program as a pilot during the 2011 through 2013 timeframe. Pilot results will be evaluated in 2013. If the market response and measure savings indicate the Program is cost effective, and achieving substantial savings, the Company will include the full program offering in its 2014 EE Plan.

Measurement, Evaluation, and Research Plan

Upon receipt of a project's pre-installation report, the program IC will identify the appropriate M&V activities (using either the established protocols for common measures or through direct metering or billing analysis for unique projects) and assist the project sponsor in establishing the baseline prior to approving the submittal and granting permission to proceed with the installation of the measures.

Quality Assurance and Control

Pre- and post-installation metering and/or billing analysis will be required of all projects to ensure that savings estimates are in line with actual savings produced by projects. Metering activity will adhere to standard industry M&V protocols.

Program Costs and Benefits

UNS Electric recommends a budget of $150K beginning in 2011 for Bid for Efficiency. While it is unknown exactly what types of projects participants may submit, UNS Electric's analysis of likely energy savings projects based on an average incentive of $0.15/kWh saved results in the estimates shown in the table below. Actual results from the Pilot will be used to update these numbers as they become available.

Table 1-2. Measure Savings, Incentive Level, and Participation, Benefit-Cost

Measure	Annual Energy Savings (kWh) /Unit	Peak Demand Savings (kW)/ Unit	Avg. Incentive / Unit	Unit Basis	2011 Units	2012 Units	Measure Level Societal Test Result
Bid for Efficiency	400,000	36.53	$60,000	Per Customer	2	4	3.3

Table 1-3. Program Budgets

	Incentives	Program Delivery	Program Marketing	Utility Program Administration	Evaluation	Total Program Cost	Lifetime Net Benefits ($)	Program Level Societal Cost Test
2011	$120,000	$1,715	$18,257	$1,458	$5,657	$147,087	$236,444	2.9
2012	$240,000	$27,943	$40,191	$3,003	$12,445	$323,583	$443,480	2.7

Table 1-4. Environmental Benefits

	Annual CO2 Savings (Metric Tons)	Annual NOx Savings (Metric Tons)	Annual SOx Savings (Metric Tons)	Lifetime CO2 Savings (Metric Tons)	Lifetime NOx Savings (Metric Tons)	Lifetime SOx Savings (Metric Tons)
2011	360	0.05	0.00	3,597	0.50	0.02
2012	719	0.10	0.00	7,194	1.00	0.03

Table 1-5. Program Cost and Savings Summary

	Per Project	Total Program, 2011
Savings versus Standard Design	15%	15%
Customer Incentive (Estimate)	$60,000	$120,000
Energy Savings per project (Estimate)	400,000 kWh	884,000 kWh
Non-Incentive Program Costs		$27,087
Societal Cost-Benefit Ratio (Estimate)	3.3	2.9

Participating projects must demonstrate the capability to produce a minimum savings of 200,000 kWh during their first year of operation to be eligible for the Program. Individual projects are estimated to produce approximately 400,000 kWh of savings during their first year of operation. First-year program-wide savings are estimated to be 884,000 kWh.

The cost effectiveness of each project participating in the Program, and the Program as a whole will be assessed using the Societal Cost ("SC") test.

The cost effectiveness analysis requires estimation of:

- Net demand and energy savings attributable to the Program.
- Net incremental cost to the customer of completing the EE project, and of conducting quality installation and test and repair activities.
- Program administration costs; and
- The present value of Program benefits including utility avoided costs over the life of the measures.

Measure Analysis Sheets

Incentive Calculations
Bid for Efficiency

C&I Facilities - Bid for Efficiency

PROGRAM DATA	
Measure Life (yrs)**:	10
Program Life (yrs):	5
Demand AC ($/kW):	64.51
Summer On-pk Energy AC ($/kWh):	0.08
Summer Off-pk Energy AC ($/kWh):	0.06
Winter On-pk Energy AC ($/kWh):	0.07
Winter Off-pk Energy AC ($/kWh):	0.06
Program Administrative Costs ($/unit):	0
IRP Discount Rate:	9.02%
Social Discount Rate	4.00%
NTG Ratio:	100%

RATE DATA	
Res Ave	
$/kW:	0.00
$/kWh, On-Peak:	0.11
$/kWh, Off-Peak:	0.11

OPERATING DATA**	
Op Hours:	8,760
Summer Ratio:	50%
Winter Ratio:	50%
Coincidence Factor:	80%

OTHER FACTORS	
Line Loss Energy Factor:	9.5%
Line Loss Demand Factor:	9.5%
Capacity Reserve Factor:	0.0%
Application	RET
Cost Basis:	Full Installed

DEMAND/ENERGY SAVINGS					INCENTIVE CALCULATIONS						CUSTOMER COST/SAVINGS				WGT.	% Incent	Societal
Measure Type	Non-Coincident Demand Savings** (KW)	Coincident Demand Savings (kW)	OnPeak Energy Savings** (kWh)	OffPeak Energy Savings** (kWh)	IRP PV Benefit ($)	Social PV Benefit ($)	Recommended Incentive* ($)	Recommended Incentive* % PV	PV Program Cost ($)	NPV ($)	Incr. Cost** ($)	Cost Savings ($)	Payback w o/Inc. (yrs)	Payback w /Inc. (yrs)	Weighting Factor**	(%)	BC Ratio
Per Customer	45.66	36.53	200,000	200,000	209,855	265,456	60,000	29%	80,000	129,855	80,000	43,848	1.8	0.5	100%	75%	3.3
Weighted Average	45.66	36.53	200,000	200,000	209,855	265,456	60,000	29%	80,000	129,855	80,000	43,848	1.8	0.5	100%	75%	3.3

*Incentive based on 2011 UES Program Planning, $.15/kWh saved and 75% cap of incremental cost.
**Demand Savings, OnPk Off Pk Energy Savings, Operating Data, Weighting Factors, Incremental Costs, and Measure Life based on engineering assumptions based on past program data and program planning.

File Name: Bid4Eff_MAS_SB_UNSE_2011_01_12

APPENDIX F:

UNS Electric Retro-Commissioning Program

Program Description

Retro-Commissioning ("RCx") involves using a systematic approach to identify building equipment or processes that are not achieving optimal performance or results in an existing facility. Buildings are not always commissioned correctly when first built. Existing buildings also tend to drift away from their design points with age, and periodic examination and resetting of those systems is required to run an efficient facilities portfolio. Once deficiencies are identified, necessary adjustments can be made to produce energy savings along with other key benefits such as improved occupant comfort. Facility improvements made in response to RCx efforts are commonly inexpensive to implement and typically offer paybacks of less than two years.

Program Objectives and Rationale

Some of the major objectives from the Program are to:

- Generate significant savings for Demand –Side Management ("DSM") portfolio objectives by tapping into energy savings opportunities present in existing commercial and industrial facilities;
- Develop relationships with commercial and industrial customers leading to other areas of participation in UNS Electric, Inc.'s ("UNS Electric" or "Company") portfolio of DSM programs;
- Develop the RCx contractor base;
- Promote efficient building operations;
- Lower energy bills for the consumer;
- Longer equipment service life; and
- Fewer service and maintenance calls.

A 2009 study of retro-commissioning by Lawrence Berkeley National Labs[1] (LBNL) looked at 561 RCx projects on existing buildings representing almost 100 million square feet of floor space. Median savings were 16 percent of the whole building energy costs. ENERGY STAR® recognizes RCx as a crucial first step in increasing energy efficiency in facilities. The Leadership in Energy & Environmental Design ("LEED") certification also recognizes the value in retro-commissioning and offers points towards LEED for Existing Buildings: Operations and Maintenance (LEED-EBOM) certification for existing building commissioning activities.

Documented benefits of RCx include, but are not limited to the following:

- Up to 15% energy savings
- Reduced occupant complaints and improved occupant comfort
- Increased equipment life
- Increased documentation
- Facility staff training

[1] "Building Commissioning A Golden Opportunity for Reducing Energy Costs and Greenhouse Gas Emissions" LBNL, July, 2009

Target Market

The Program will target large facilities who receive electric service from UNS Electric. Large office, small office, and large retail represent the largest commercial users with lighting, cooling, and ventilation representing the largest end uses. This approach is aimed at that market of large commercial customers and those end uses.

Program Eligibility

The following eligibility requirements will apply to the RCx Program:

- The Program is available to commercial and/or industrial customers of UNS Electric; and
- For each site there must be at least one meter that is on an eligible rate schedule.

In order to qualify for the Program, a facility must meet the following criteria:

- Have 100,000 square feet or more of conditioned area; and
- Have a dedicated facility staff.

Preference will be given to facilities with central heating and cooling plants.

Current Baseline Conditions

The primary barriers to more widespread implementation of this cost effective strategy are lack of education and information by building operators, lack of qualified workforce and the upfront cost of the audit and associated equipment optimization.

Programs similar to the proposed pilot are being offered by a number of utilities across the nation with reputations for achieving success in energy efficiency program offerings. The strategy is proving to be an effective means for tapping into energy saving opportunities in existing facilities.

Products and Services

In order to maximize the benefits of the Program, the process has been broken down into phases for this program. Qualified applicants will be screened for participation prior to being accepted into the program. Selected participants will then undergo a three part RCx study.

- The first phase is centered on a basic operations and maintenance review to establish the Current Facility Requirements ("CFR") and identify operations and maintenance-related facility improvement measures. Facilities may then be accepted into the second phase of investigations that are centered on commissioning the systems to ensure that they are able to meet the CFR.
- The second phase is accomplished through functional performance testing and diagnostics of the major energy systems serving the facility.
- The final phase of the process involves optimizing the existing systems. The activities in this phase are centered on determining the potential for introducing advanced control strategies or other approaches that make full use of building system controls.

Delivery Strategy, Incentive Processing, and Administration

UNS Electric offers will offer a streamlined application process that will be simple for applicants to complete. Customers will be able to apply for participation in the RCx Program by submitting the RCx Application on line at the UNS Electric web site. Much of the data collection required to identify good candidates will be collected by the Program staff during the Screening Energy Audit Phase. Eligible applicants will be contacted for scheduling of the Screening Energy Audit by Program personnel, and Program staff will be available during normal business hours to facilitate the application process.

Applicants that do not meet the eligibility requirements will receive written notification explaining why the applicant doesn't qualify.

Details of each phase of the implementation process are presented below.

Screening Energy Audits

Screening Energy Audits are provided free of charge to all eligible applicants. The screening audit will provide the applicant with a basic energy audit, identifying basic equipment upgrades and control strategies that would result in energy savings for the customer. The facilities audited will also be provided with ENERGY STAR® Portfolio Manager ratings to benchmark the facility versus similar facilities in their area. The energy audit will also be used to screen applicants for participation in the RCx Program.

Operations and Maintenance Review Phase

The Operations and Maintenance ("O&M") Review Phase of the RCx study will be dedicated to performing a review of energy related operational procedures and determining the state of maintenance practices related to major equipment. The end result of this review will be a list of facility improvement measures with estimated savings and cost values. The O&M Review phase is provided at no cost to the customer.

The initial task of the O&M review will be to establish the CFR. The CFR is a guiding document that determines the parameters by which all systems will be evaluated. It is established based on input from the facilities team or owners rep regarding the key requirements that the facility must meet. Any variance between what has been identified in the CFR and the actual facility's performance is identified as a deficiency. After appropriate investigation, recommendations are made to resolve identified deficiencies in the form of facility improvement measures ("FIM"). The CFR has quantitative values for HVAC, comfort, scheduling, and air quality requirements. The CFR may also include qualitative information for facility performance and company priorities. The CFR is intended to be a living document that is updated as needed and kept as a reference for future projects and training.

With the CFR established the commissioning team will review settings in the building automation system and established operational practices for compliance with the CFR. Deficiencies will be identified and either have an FIM established for the deficiency or be marked for further investigation in subsequent phases.

A basic maintenance review will be conducted to identify any limitations of the systems to meet the CFR due to maintenance issues. The maintenance review will identify if there are any simple repairs that can be performed to save energy. The review will also determine if the equipment is in sufficient condition to merit moving forward into the systems commissioning phase or if capital improvement should be implemented instead. Systems reviewed may include chillers, boilers, air handling units, air dampers, pumps, fans and other equipment. The maintenance review will also identify any gaps in predictive or preventative maintenance procedures that could lead to an inability to meet the CFR.

Customers will receive a report of O&M-based FIMs. Customers will also receive training at the end of this phase on maintaining the CFR, O&M best practices and how to maintain the facility improvements identified in this phase.

Systems Commissioning Phase

The Systems Commissioning Phase of the RCx Program utilizes performance testing, trending and metering to ensure that the major energy using systems are capable of meeting the CFR. For larger systems sampling of similar components will be encouraged to contain costs. The trending capability of the building automation system in conjunction with portable data loggers will be used to verify that systems are able to operate efficiently within the CFR, and to identify FIMs that will allow the systems to do so.

Measures identified during these investigations correspond with repairs, upgrades, and capitol planning that will allow existing systems to operate within the required parameters. At the end of this phase, customers will receive training on maintaining the systems commissioning and how to maintain the identified facility improvements. The Systems Commissioning Phase commissioning services costs will be paid by the Program for selected customers who implement recommendations identified during the O&M Review phase.

Systems Optimization Phase

The Systems Optimization Phase of the RCx Program involves introducing more complex high performance building operation strategies to the current systems. This phase builds on the work done in the prior phases by introducing the cutting edge practices that have been developed for today's high performance buildings. The commissioning professionals will help the owner identify new control strategies to allow the facility to reach full potential. At the end of this phase, the customer will be provided with training on how to maintain the control strategies identified in this phase. Such strategies may include the use of alarms, and Building Automation Systems ("BAS") trending. Commissioning services for this phase are paid by the Program for selected customers who implement recommendations identified during the Systems Commissioning Phase.

Program Marketing and Communication Strategy

The Pilot will be marketed using traditional forms of media (print, web, newsletters, etc.), as well as targeted direct mail and outreach to engineering and trade associations. The UNS Electric website will also be updated to include information and links for participation in this initiative. Program administrators and implementation contractors will also be called upon to reach out to larger customers to encourage participation.

Program Implementation Schedule

The RCx Pilot Program would begin accepting applications for participation in September 2011. Subsequent program year budgets and plans will be made available towards the end of the existing program year 2011.

Measurement, Evaluation, and Research Plan

The measurement, evaluation, and research ("MER") team will develop a MER research plan and conduct annual evaluation research on the achievements of this program.

Quality Assurance and Control

Quality assurance and Control are provided at several UNS Electrics throughout the program application and implementation process as outlined in the sections above. Savings verification plans are required of all applicants.

Program Costs and Benefits

Program funding is subject to limitation. As a result, only a finite number of facilities will be allowed into the Pilot.

Table 1-1. Measure Savings, Incentive Level, and Participation, Benefit-Cost

Measure	Annual Energy Savings (kWh) /Unit	Peak Demand Savings (kW)/ Unit	Avg. Incentive / Unit	Unit Basis	2011 Units	2012 Units	Measure Level Societal Test Result
Retro-Commissioning	200,000	18.26	$22,000	Per 100K Sq Ft	-	9	4.6

Table 1-2. Program Budgets

	Incentives	Program Delivery	Program Marketing	Utility Program Administration	Evaluation	Total Program Cost	Lifetime Net Benefits ($)	Program Level Societal Cost Test
2011	$0	$0	$0	$0	$0	$0	$0	N/A
2012	$198,000	$13,730	$31,759	$3,003	$9,860	$256,352	$630,594	3.7

Table 1-3. Environmental Benefits

	Annual CO2 Savings (Metric Tons)	Annual NOx Savings (Metric Tons)	Annual SOx Savings (Metric Tons)	Lifetime CO2 Savings (Metric Tons)	Lifetime NOx Savings (Metric Tons)	Lifetime SOx Savings (Metric Tons)
2011	-	-	-	-	-	-
2012	809	0.11	0.00	8,093	1.12	0.04

Measure Analysis Sheets

Incentive Calculations
Custom Measures

C&I Facilities - Retrocommissioning

PROGRAM DATA	
Measure Life (yrs)**:	10
Program Life (yrs):	5
Demand AC ($/kW):	64.51
Summer On-pk Energy AC ($/kWh):	0.08
Summer Off-pk Energy AC ($/kWh):	0.06
Winter On-pk Energy AC ($/kWh):	0.07
Winter Off-pk Energy AC ($/kWh):	0.06
Program Administrative Costs ($/unit):	0
IRP Discount Rate:	9.02%
Social Discount Rate	4.00%
NTG Ratio:	100%

RATE DATA	
Res Ave	
$/kW:	0.00
$/kWh, On-Peak:	0.11
$/kWh, Off-Peak:	0.11

OPERATING DATA**	
Op Hours:	8,760
Summer Ratio:	50%
Winter Ratio:	50%
Coincidence Factor:	80%

OTHER FACTORS	
Line Loss Energy Factor:	9.5%
Line Loss Demand Factor:	9.5%
Capacity Reserve Factor:	0.0%
Application	RET
Cost Basis:	Full Installed

	DEMAND/ENERGY SAVINGS				INCENTIVE CALCULATIONS						CUSTOMER COST/SAVINGS				WGT.	% Incent	Societal
Measure Type	Non-Coincident Demand Savings (KW)	Coincident Demand Savings (kW)	OnPeak Energy Savings** (kWh)	OffPeak Energy Savings** (kWh)	IRP PV Benefit ($)	Social PV Benefit ($)	Recommended Incentive* ($)	% PV	PV Program Cost ($)	NPV ($)	Incr. Cost** ($)	Cost Savings ($)	Payback w o/inc. (yrs)	Payback w /inc. (yrs)	Weighting Factor**	(%)	BC Ratio
Per 100K sqft	22.83	18.26	100,000	100,000	104,927	132,728	22,000	21%	29,333	75,594	29,333	21,924	1.3	0.3	100%	75%	4.5
Weighted Average	22.83	18.26	100,000	100,000	104,927	132,728	22,000	21%	29,333	75,594	29,333	21,924	1.3	0.3	100%	75%	4.5

*Incentive based on 2011 UES Program Planning, $.10/kWh saved and 75% cap of incremental cost.
**OnPk Off Pk Energy Savings, Operating Data, Weighting Factors, Incremental Costs, and Measure Life based on engineering assumptions based on past program data and program planning.

File Name: Retro_MAS_SB_UNSE_2011_01_12

APPENDIX G:

UNS Electric Behavioral Comprehensive Program

Program Description

In its desire to increase savings yields from Demand-Side Management ("DSM") programs, there are several tracks UNS Electric, Inc. ("UNS Electric") is taking: Introduce new programs, introduce new measures to existing programs, and increasing participation in existing programs. Behavior based programs have elements of all of these approaches.

Behavioral programs are designed to affect habitual behaviors like turning off lights or adjusting the thermostat, purchasing behaviors such as buying efficient lights and appliances and the behavior of participating in utility DSM programs. The new Behavioral Comprehensive programs target specific and relevant efficiency recommendations to each customer, including information about key energy efficiency ("EE") programs, making it easier for each customer to take action on the recommendations and programs most relevant to them.

The types of behaviors to be influenced include:

- Habitual behaviors
  - Adjust thermostat setting
  - Adjust water heater set point
  - Unplug appliances or use smart strips
  - Turn off unnecessary lights
  - Run dishwasher only when full
  - Wash clothes in cold water
  - Line dry laundry
- Small purchasing and maintenance behaviors
  - Purchase install and program a programmable thermostat
  - Purchase and install faucet aerators and low flow shower heads
  - Purchase and install compact fluorescent light bulbs
  - Request home energy audit to improve EE
  - HVAC maintenance
  - Clean refrigerator coils
- Larger purchasing decisions
  - Purchase an ENERGY STAR® appliance
  - Install extra insulation and implement air sealing to make home more EE
  - Install EE windows and doors
  - Purchase higher EE heating and cooling system

UNS Electric will influence these behaviors through a suite of initiatives including:

- Home energy reports
- Direct canvassing – a grass roots, door to door approach
- K-12 education, harnessing the enthusiasm of kids and the community focal point of schools to mobilize for energy efficiency
- Community Education – enhancing the efforts of community organizations with hands on training for efficiency mentors and community members.

Program Objectives and Rationale

Technology-based energy efficiency achieves only a fraction of total efficiency potential. The barriers to wider spread implementation of energy efficiency are sociological not technological. In fact, in recent Federal testimony, the ACEEE stated that recent studies suggest that:

"...the potential behavior-related energy savings in the residential sector alone represent roughly 25 percent of current residential sector energy consumption."

Capturing a larger fraction of energy efficiency potential requires behavior change. Recognition of behavior change as efficiency potential is essential to the evolution of utility energy efficiency programs. Efficiency programs will need to integrate behavior change strategies into their DSM portfolios in order to fully realize their achievable potential.

There is much utility interest in behavior based initiatives as is evidenced by significant increase in the number and attendance of events taking place in this nascent field. Data is accumulating that show the real and measurable savings to be had through behavior based initiatives. That being said, some behavior based programs represent a divergence from the historical approach to energy efficiency program design, implementation and evaluation and care must be taken to design programs that will generate verifiable savings that will sustain the rigor of evaluation protocol.

Behavioral science-based marketing, data analytics, and cutting-edge software are the tools being applied in this program to broadly and deeply engage utility customers. Utility based behavior initiatives can be categorized into 4 broad categories: Mass Media/Social Media, Community Based Social Marketing, Feedback and Competitions. UNS Electric's proposed plan includes aspects of all of these.

The primary barriers to wider spread implementation of this approach are:

- Efficiency is invisible;
- Most people when asked if they want to save energy will say yes. Often they think they are already doing what they can to be energy efficient;
- Not knowing what to do, or what to do first;
- Not knowing where to obtain energy efficient products and services;
- Perceptions of cost, financial constraints;
- Doubt regarding the ability to make a significant difference in energy use/cost;
- Methodologies to measure savings through behavioral initiatives are not widely known; and
- Questions regarding the persistence of savings from behavioral initiatives.

Some of the major objectives from this program are to:

- Generate significant savings for DSM portfolio objectives;
- Develop relationships with UNS Electric customers leading to other areas of participation in UNS Electric's portfolio of DSM programs;
- Enhance UNS Electric's positive image and improve the UNS Electric brand;
- Promote efficient building operations;
- Lower energy bills for the consumer; and
- Plant seeds for future energy users through school and community outreach.

Target Market

Behavioral initiatives apply to all UNS Electric customers. They can be targeted at homes and/or businesses. The focus for this effort is on behavioral change within residences.

Program Eligibility

All UNS Electric residential customers will be eligible for this program.

Current Baseline Conditions

While consumer attitudes and awareness regarding the impacts of our energy use and the potential of energy efficiency are increasing, and an ever increasing percentage of people express a willingness to take action, there is often confusion about energy efficiency terms, what concrete steps can be taken and how much of an impact they will have. Awareness of and favorable attitudes toward energy efficiency in general do not necessarily correlate with intentions to purchase specific energy efficient products or take particular energy efficient actions. There is also typically a significant gap between awareness and action that must be addressed through specific targeted actionable messages. Many people believe they are "doing all they can" while the reality is they could easily do more.

"Consumers have been conditioned to think that their driving habits are the best way to help the environment. They have not realized that the biggest thing they can do is use less electricity and be more energy efficient" —Shelton Research Group

Products and Services

Behavior programs are made up of the Home Energy Reports Program, and the Behavior Comprehensive Program which is made up of several unique initiatives as follows:

- Direct Canvassing
- K-12 Education
- Community Education
- CFL Give-Away

Each initiative is described in some detail in the succeeding sections.

Delivery Strategy, Incentive Processing and Administration

Doug McKenzie-Mohr, PhD, is an environmental psychologist and a leading expert in the design of programs to promote sustainable behavior. Dr. McKenzie-Mohr, a noted pioneer and expert in behavior based energy efficiency initiatives, suggests the following steps in designing a successful behavior based campaign:

- Identify barriers and benefits
- Develop strategies using behavior change tools
- Pilot the initiative as a carefully designed experiment and refine according to findings
- Implement
- Evaluate

As outlined throughout this section, this plan follows that path. In addition to being new, behavior based programs are relatively unique and require specialized expertise to implement. Accordingly, UNS Electric put out an RFP for behavior based implementation providers and all of the five behavior based approaches are being delivered by separate implementation contractors. At the writing of this filing, all implementation contractors had not yet been selected.

Home Energy Reports

UNS Electric's Home Energy Report Program is designed to affect: (1) habitual behaviors like turning off the lights or adjusting the thermostat; (2) purchasing behaviors such as buying efficient light bulbs and appliances; and (3) the behavior of participating in utility DSM programs by preparing reports that compare a customer's energy use to that of neighbors.

The major objectives from this Program are to:

- generate significant savings for DSM portfolio objectives;
- educate and empower customers to take advantage of other DSM programs;
- develop a positive utility image;
- promote efficient building operations; and
- lower energy bills for consumers.

All Home Energy Report products will be automatically mailed to the target market by the implementation contractor. Thus, no direct marketing is anticipated for this Program. UNS Electric will, however, jointly develop the marketing message contained in the Home Energy Reports with the contractor. The Program will also be included in the integrated marketing approach developed and used for all DSM measures.

Direct Canvassing

The direct canvassing initiative is a grass-roots, door to door approach to inducing behavior change for energy efficiency. Volunteers from local community organizations are trained and deployed to go door to door and talk to customers about energy efficiency. Two CFL bulbs are left behind with the customers as well as program materials for appropriate UNS Electric DSM programs. This approach capitalizes on the sociological research which shows people are more likely to take action when the information is delivered by a trusted source, such as a member of their own community.

K-12 Education

The K-12 Education approach is an extension of the existing UNS Electric education program. In this approach, in addition to energy based class room curriculum, students will be instructed in energy saving approaches that can be implemented in their homes. Students will be provided a take home kit which includes several energy saving devices such as CFL's, faucet aerators and educational materials regarding actions that can be taken to reduce energy use.

Community Education

The Community Education Program will engage community groups and work with public entities with "train the trainer" hands-on energy efficiency seminars. Community trainers will be given a broad based review of energy, efficiency and comfort principles. This creates a level of understanding which dovetails into identifying specific actions and behaviors to reduce energy consumption at home, work or play. Community groups such as the Metropolitan Energy Commission, the Sonoran Environmental Research Organization, and other neighborhood organizations are engaged both to identify mentors to be trained and to schedule sessions led by these mentors for community members on a grass roots level. The seminars include hands-on training with a wide sample of materials such as weather stripping, low flow showerheads, caulk or foam sealant, CFL's, etc. provided to participants. Energy savings are attributed to the direct install items included in the seminar materials for neighborhood participants. Efforts to coordinate neighborhood sessions with school curriculum activities or to reinforce direct canvassing initiatives will aid the adoption and retention of energy efficient behaviors.

CFL Give-Away

The Compact Florescent Light Give-Away program will complement UNS Electric's presence at community events, its overall education and outreach efforts, and efficiency messaging. Free compact fluorescent light bulbs will be made available at community events and to community organizations such as those involved in our Community Education Program. Flexibility to add methods and develop partnerships to aid in the distribution of these bulbs is a program design element which will enhance program effectiveness over its lifespan.

Program Marketing and Communication Strategy

Marketing of the behavior approaches will be handled by the implementation contractors and coordinated with UNS Electric's overall messaging to reinforce the effectiveness of the behavior programs. Each approach will involve a unique strategy:

- Home energy reports will be offered in an opt-out approach; in other words, participants will be chosen at random and limited to those selected. The program will not be marketed through traditional channels but is itself a tool to educate and encourage behaviors like participating in other programs.
- The recipients of the direct canvassing approach will be chosen by UNS Electric based on criteria regarding which demographic group is wished to be reached. Those who receive direct canvassing will be limited to the demographic group or geographic area designated by UNS Electric. The program will be marketed for widespread community awareness in advance.
- The K-12 Education approach involves sending students home with energy conservation kits. Those who receive the kits will be those who receive the energy curriculum provided by the implementation contractor. The program will not be marketed through traditional channels. Effort will be made when possible to coordinate the school program with other efforts in the same neighborhood.

- Community education seminars will be channeled through public and social organizations in order to maximize the effectiveness of the energy efficiency outreach efforts of those organizations. The program will not be marketed through traditional channels.
- The CFL Give-Away program will provide up to 150,000 free compact fluorescent light bulbs per year to UNS Electric customers at community events, through community organizations and additional efforts. Marketing messages are anticipated in conjunction with other programs and through traditional channels.

Program Implementation Schedule

Table 1-1 shows the estimated timeline for key program activities by quarter.

Table 1-1. Implementation Schedule

Program Activities	2011				2012			
Submit program for approval								
Program approval (estimated)								
Selection of implementation contractors								
Create marketing materials, hire staff, set up AZ office								
Program kick-off and implementation								

Measurement, Evaluation, and Research Plan

UNS Electric will conduct an evaluation of Program participants to assess the effectiveness of behavior program initiatives. UNS Electric will determine how effective the initiatives have been in encouraging customers to make behavioral changes that save energy and how effective the initiatives have been in encouraging participation in other available EE programs, UNS Electric will also measure energy savings of both groups against a control group to determine actual energy savings and which of the initiatives are most effective. Results will be analyzed and Program design refined according to findings. Other similar behavioral applications may also be analyzed in the future to take advantage of new found insights.

In recognition of the fact that behavior based initiatives must provide a highly reliable evaluation protocol, we have proactively designed one that gets at the key issues of:

- Boomerang effect: Low-energy users may respond to the usage feedback and neighbor comparison by increasing energy consumption;
- Growth/decay effect: Over time the treatment effect may evolve, perhaps growing (energy savings increases), perhaps decaying;
- Treatment persistence: Energy savings may persist after termination of treatment; and
- Rebound effect: After an extended period without treatment a household may respond to renewed treatment with a savings "bounce".

In order to accomplish this, the pilot design includes setup of test and control groups:

- Divide targeted population into two statistically equivalent groups
- Verify Groups: Verify no historical difference in usage between test and control groups Deploy the strategy to test group only, no action taken with control group
- Measure Impact: Compare average energy use pre and post reports for both groups

UNS Electric will evaluate the energy savings from the behavioral initiatives by using a third party evaluator experienced in evaluating behavioral initiatives.

Quality Assurance and Control

The initiatives will be delivered by implementation contractors. Implementation contractors each have internal QC protocols appropriate to their specific approach. The implementation contractors will be managed and quality assurance will be maintained by the program administrator. Customers will be surveyed and spot checks made to assure quality program delivery.

Program Costs and Benefits –Home Energy Reports

Table 1-2. Measure Savings, Incentive Level, and Participation, Benefit-Cost

Measure	Annual Energy Savings (kWh) /Unit	Peak Demand Savings (kW)/ Unit	Avg. Incentive / Unit	Unit Basis	2011 Units	2012 Units	Measure Level Societal Test Result
Home Energy Reports	375	0.03	$12	Per Home	15,000	20,000	1.7

Program Costs and Benefits (Other Products)

Table 1-3. Measure Savings, Incentive Level, and Participation, Benefit-Cost

Measure	Annual Energy Savings (kWh) /Unit	Peak Demand Savings (kW)/ Unit	Avg. Incentive / Unit	Unit Basis	2011 Units	2012 Units	Measure Level Societal Test Result
K-12 Education Kit	168	0.01	$25	Per Home	2,400	2,400	2.7
Community Education Kit	332	0.03	$56	Per Home	-	-	2.9
Direct Canvasing	68	0.01	$3	Per Home	-	9,000	7.8
CFL Giveaway (23 W)	56	0.01	$2	Per Home	75,000	-	11.2
CFL Giveaway (18 W)	41	0.00	$2	Per Home	-	75,000	7.1

Table 1-4. Program Budgets – Home Energy Reports

	Incentives	Program Delivery	Program Marketing	Utility Program Administration	Evaluation	Total Program Cost	Lifetime Net Benefits ($)	Program Level Societal Cost Test
2011	$148,500	$36,087	$9,229	$7,289	$8,044	$209,150	$70,303	1.3
2012	$256,600	$22,819	$13,971	$7,507	$12,036	$312,933	$118,271	1.4

Table 1-5. Program Budgets (Other Products)

	Incentives	Program Delivery	Program Marketing	Utility Program Administration	Evaluation	Total Program Cost	Lifetime Net Benefits ($)	Program Level Societal Cost Test
2011	$200,250	$89,606	$5,000	$2,915	$11,911	$309,683	$1,417,256	5.6
2012	$252,270	$218,493	$25,000	$3,003	$19,951	$518,716	$1,030,890	3.0

Table 1-6. Environmental Benefits - Home Energy Reports

	Annual CO2 Savings (Metric Tons)	Annual NOx Savings (Metric Tons)	Annual SOx Savings (Metric Tons)	Lifetime CO2 Savings (Metric Tons)	Lifetime NOx Savings (Metric Tons)	Lifetime SOx Savings (Metric Tons)
2011	2,529	0.35	0.01	2,529	.35	0.01
2012	3,372	0.47	0.02	3,372	.47	0.02

Table 1-7. Environmental Benefits (Other Products)

	Annual CO2 Savings (Metric Tons)	Annual NOx Savings (Metric Tons)	Annual SOx Savings (Metric Tons)	Lifetime CO2 Savings (Metric Tons)	Lifetime NOx Savings (Metric Tons)	Lifetime SOx Savings (Metric Tons)
2011	2,058	0.29	0.01	12,350	1.71	0.06
2012	1,846	0.26	0.01	11,074	1.54	0.05

Measure Analysis Sheets

Incentive Calculations

Home Energy Report (Residential)

Providing Energy Consumption Reports to Customers (Residential)

PROGRAM DATA	
Measure Life (yrs):	1
Program Life (yrs):	1
Demand AC ($/kW):	$49.44
Summer On-pk Energy AC ($/kWh):	$0.06
Summer Off-pk Energy AC ($/kWh):	$0.04
Winter On-pk Energy AC ($/kWh):	$0.05
Winter Off-pk Energy AC ($/kWh):	$0.04
Weighted Energy AC ($/kWh):	$0.05
Administrative Costs ($):	NA
Discount Rate:	9.02%
Societal Discount Rate	4.00%
NTG Ratio:	100%

RATE DATA	
Rate:	
$/kW:	$0.00
$/kWh, On-Peak:	$0.11
$/kWh, Off-Peak:	$0.11

OPERATING DATA	
On-Pk Ratio:	29%
Off-Pk Ratio:	71%
Summer Ratio:	50%
Winter Ratio:	50%
Coincidence Factor:	100%

OTHER FACTORS	
Line Loss Factor-Deman	9.5%
Line Loss Factor-Energy:	9.5%
Capacity Reserve Factor	0.0%
Application	Existing
Cost Basis:	Retrofit

DEMAND/ ENERGY SAVINGS						INCENTIVE CALCULATIONS						CUSTOMER COST/ SAVINGS				WGT.	Societal
Program Savings (% of Sales)	Customer Energy Savings (kWh/ yr)	Non-Coin. Demand Savings (KW)	Coin. Demand Savings (KW)	On-pk Savings (KWh)	Off-pk Savings (KWh)	IRP PV Benefit ($)	Societal PV Benefit ($)	Recommended Incentive ($)	Recommended Incentive %PV	PV Program Cost ($)	NPV ($)	Incr. Cost ($)	Cost Savings ($)	Payback wo/ Inc. (yrs)	Payback w/ Inc. (yrs)	Weighting Factors (%)	BC Ratio
2.5%	375	0.029	0.029	109	266	19	20	12	61%	12	7	12	41	0.3	0.00	100%	1.7

Absent meaningful program data, savings are assumed to be spread throughout the day and year following the same trend as typical daily and annual loadshape for UNSE (see explaination in "Savings&Cost Calc")

File Name: HomeEnergyReport_MAS_Res_UNSE_2011_01_14

Incentive Calculations

Behavioral Programs **CFL Give-Away**

PROGRAM DATA	
18 W Measure Life (yrs):	5
23 W Measure Life (yrs):	6
Program Life (yrs):	20
18 W Demand AC ($/kW):	$55.65
18 W Summer On-pk Energy AC ($/kWh):	$0.07
18 W Summer Off-pk Energy AC ($/kWh):	$0.05
18 W Winter On-pk Energy AC ($/kWh):	$0.06
18 W Winter Off-pk Energy AC ($/kWh):	$0.05
23 W Demand AC ($/kW):	$57.31
23 W Summer On-pk Energy AC ($/kWh):	$0.07
23 W Summer Off-pk Energy AC ($/kWh):	$0.05
23 W Winter On-pk Energy AC ($/kWh):	$0.06
23 W Winter Off-pk Energy AC ($/kWh):	$0.06
Admin Costs per Bulb:	NA
Discount Rate:	9.02%
Societal Discount Rate:	4.00%
NTG Ratio:	100%

RATE DATA	
Rate:	
$/kW:	0.00
$/kWh, On-Peak:	$0.11
$/kWh, Off-Peak:	$0.11

OPERATING DATA	
On-Pk Op. Hours:	274
Off-Pk Op. Hours:	577
Summer Ratio:	41%
Winter Ratio:	59%
Coincidence Factor:	0.08
In-Service Rate	75%
Leakage Rate	0%
HVAC Interaction Factor (Demand):	0.41
HVAC Interaction Factor (Energy):	0.13

OTHER FACTORS	
Line Loss Factor - Demand:	9.5%
Line Loss Factor - Energy:	9.5%
Capacity Reserve Factor:	0%
Application	ROB
Cost Basis:	Incremental

	DEMAND/ENERGY SAVINGS							INCENTIVE CALCULATIONS						CUSTOMER COST/SAVINGS				WGT.	%Incent	Societal
Kit Contents	Number per Kit	Inc. Fixture Watts	CFL Fixture Watts	Non-Coincident Demand Savings (KW)	Coincident Demand Savings (KW)	On-pk Energy Savings (KWh)	Off-pk Energy Savings (KWh)	IRP PV Benefit ($)	Societal PV Benefit ($)	Recommended Incentive ($)	Recommended Incentive %PV	PV Program Cost ($)	NPV ($)	Incr. Cost ($)	Cost Savings ($)	Payback wo/ Inc. (yrs)	Payback w/ Inc. (yrs)	Weighting Factor	(%)	BC Ratio
23 Watt Twist	1	100	23	0.081	0.007	18	38	18	21	2	11%	2	16	2	6	0.3	0.0	100%	100%	11.1
18 Watt Twist	1	75	18	0.060	0.005	13	28	11	12	2	20%	2	9	2	5	0.5	0.0	100%	100%	5.7

File Name: CFLGiveAway_MAS_Res_UNSE_2010_12_20

Incentive Calculations

Education and Outreach - Community Education

Community Energy Education Program Kit

PROGRAM DATA	
CFL 13 W Measure Life:	6
Faucet Aerator Life**:	10
Showerhead Measure Life**:	10
Night Light Measure Life:	16
Program Life (yrs):	5
CFL 13 W Demand AC ($/kW):	$57.31
CFL 13 W Summer On-pk Energy AC ($/kWh):	$0.07
CFL 13 W Summer Off-pk Energy AC ($/kWh):	$0.05
CFL 13 W Winter On-pk Energy AC ($/kWh):	$0.06
CFL 13 W Winter Off-pk Energy AC ($/kWh):	$0.06
Faucet Aerator Demand AC ($/kW):	$64.51
Faucet Aerator Summer On-pk Energy AC ($/kWh):	$0.08
Faucet Aerator Summer Off-pk Energy AC ($/kWh):	$0.06
Faucet Aerator Winter On-pk Energy AC ($/kWh):	$0.07
Faucet Aerator Winter Off-pk Energy AC ($/kWh):	$0.06
Faucet Aerator Gas AC ($/therm):	$0.78
Showerhead Demand AC ($/kW):	$64.51
Showerhead Summer On-pk Energy AC ($/kWh):	$0.08
Showerhead Summer Off-pk Energy AC ($/kWh):	$0.06
Showerhead Winter On-pk Energy AC ($/kWh):	$0.07
Showerhead Winter Off-pk Energy AC ($/kWh):	$0.06
Showerhead Gas AC ($/therm):	$0.78
Night Light Demand AC ($/kW):	$77.03
Night Light Summer On-pk Energy AC ($/kWh):	$0.09
Night Light Summer Off-pk Energy AC ($/kWh):	$0.07
Night Light Winter On-pk Energy AC ($/kWh):	$0.08
Night Light Winter Off-pk Energy AC ($/kWh):	$0.07
Administrative Cost:	NA
Discount Rate:	9.02%
Societal Discount Rate:	4.00%
NTG Ratio:	100%

RATE DATA	
Rate:	
$/kW:	0.00
$/kWh, On-Peak:	$0.11
$/kWh, Off-Peak:	$0.11

OPERATING DATA	
CFL On-Pk Op. Ratio:	23%
CFL Off-Pk Op. Ratio:	77%
Faucet Aerator On-Pk Op. Ratio:	30%
Faucet Aerator Off-Pk Op. Ratio:	70%
Showerhead On-Pk Op. Ratio:	20%
Showerhead Off-Pk Op. Ratio:	80%
Night Light On-Pk Op. Ratio*:	0%
Night Light Off-Pk Op. Ratio*:	100%
Summer Ratio:	50%
Winter Ratio:	50%
CFL 13 W Coincidence Factor:	8%
Faucet Aerator Coincidence Factor:	80%
Showerhead Coincidence Factor:	31%
LED Night Light Coincidence Factor:	0%

OTHER FACTORS	
Line Loss Factor - Demand:	9.5%
Line Loss Factor - Energy:	9.5%
Capacity Reserve Margin:	0%
Application	Retrofit
Cost Basis:	Full Install

	DEMAND/ENERGY SAVINGS						INCENTIVE CALCULATIONS						CUSTOMER COST/ SAVINGS				WGT.	%Incent	Societal
Unit Type	Annual Energy Savings (KWh)	Non Coin Demand Savings (kW)	Coincident Demand Savings (kW)	On-pk Energy Savings (KWh)	Off-pk Energy Savings (KWh)	Gas Energy Savings (Therms)	IRP PV Benefit ($)	Societal PV Benefit ($)	Recommended Incentive*** ($)	Recommended Incentive*** %PV	PV Program Cost ($)	NPV ($)	Incr. Cost ($)	Cost Savings ($)	Payback wo/ Inc. (yrs)	Payback w/ Inc. (yrs)	Weighting Factors for Program Cost	(%)	BC Ratio
2 CFLs (13 W)	91	0.099	0.008	21	70	N/A	28	32	15	56%	15	12	15	10	1.5	0.00	27%	100%	2.1
1 Bathroom Faucet Aerator	37	0.007	0.006	11	26	2	30	37	6	21%	6	23	6	4	1.5	0.00	11%	100%	6.1
1 Showerhead	173	0.056	0.017	34	139	9	93	116	29	31%	29	64	29	19	1.5	0.00	52%	100%	4.0
1 LED Night Light	32	0.007	0.000	0	32	N/A	20	29	5	26%	5	15	5	3	1.5	0.00	10%	100%	5.3
Total Kit (Measure Level)	332	0.169	0.031	66	266	11	170	214	56	33%	56	114	56	36	1.5	0.00	100%	100%	3.8

* The ratios are our best engineering assumptions, pending detailed MER work.
**DEER 2008.
***Based on UES 2011 Program Planning.

File Name: CommunityEducation_MAS_Res_UNSE_2011_01_12

Behavioral Programs

Incentive Calculations

Direct Canvass Program Kit

PROGRAM DATA	
Measure Life (yrs):	6
Program Life (yrs):	20
Demand AC ($/ kW):	$57.31
Summer On-pk Energy AC ($/ kWh):	$0.07
Summer Off-pk Energy AC ($/ kWh):	$0.05
Winter On-pk Energy AC ($/ kWh):	$0.06
Winter Off-pk Energy AC ($/ kWh):	$0.06
Admin Costs per Bulb:	NA
Discount Rate:	9.02%
Societal Discount Rate:	4.00%
NTG Ratio:	100%

RATE DATA	
Rate:	
$/ kW:	0.00
$/ kWh, On-Peak:	$0.11
$/ kWh, Off-Peak:	$0.11

OPERATING DATA	
On-Pk Op. Hours:	274
Off-Pk Op. Hours:	577
Summer Ratio:	41%
Winter Ratio:	59%
Coincidence Factor:	0.08
In-Service Rate	75%
Leakage Rate	0%
HVAC Interaction Factor (Demand):	0.41
HVAC Interaction Factor (Energy):	0.13

OTHER FACTORS	
Line Loss Factor - Demand:	9.5%
Line Loss Factor - Energy:	9.5%
Capacity Reserve Factor:	0%
Application	ROB
Cost Basis:	Incremental

	DEMAND/ ENERGY SAVINGS							INCENTIVE CALCULATIONS						CUSTOMER COST/ SAVINGS				WGT.	%Incent	Societal
Kit Contents	Number per Kit	Inc. Fixture Watts	CFL Fixture Watts	Non-Coincident Demand Savings (KW)	Coincident Demand Savings (KW)	On-pk Energy Savings (KWh)	Off-pk Energy Savings (KWh)	IRP PV Benefit ($)	Societal PV Benefit ($)	Recommended Incentive ($)	Recommended Incentive %PV	PV Program Cost ($)	NPV ($)	Incr. Cost ($)	Cost Savings ($)	Payback wo/ Inc. (yrs)	Payback w/ Inc. (yrs)	Weighting Factor	(%)	BC Ratio
13 Watt Twist	2	60	13	0.099	0.008	22	46	22	25	3	15%	3	18	3	7	0.4	0.0	100%	100%	7.7

File Name: DirectCanvassing_MAS_Res_UNSE_2010_12_20

Incentive Calculations

Education and Outreach - School Education

School Energy Education Program Kit

PROGRAM DATA	
CFL 13 W Measure Life:	6
Faucet Aerator Measure Life**:	10
Night Light Measure Life**:	16
Refrigerator Therm Measure Life*:	3
Program Life (yrs):	5
CFL 13 W Demand AC ($/kW):	$57.31
CFL 13 W Summer On-pk Energy AC ($/kWh):	$0.07
CFL 13 W Summer Off-pk Energy AC ($/kWh):	$0.05
CFL 13 W Winter On-pk Energy AC ($/kWh):	$0.06
CFL 13 W Winter Off-pk Energy AC ($/kWh):	$0.06
Faucet Aerator Demand AC ($/kW):	$64.51
Faucet Aerator Summer On-pk Energy AC ($/kWh):	$0.08
Faucet Aerator Summer Off-pk Energy AC ($/kWh):	$0.06
Faucet Aerator Winter On-pk Energy AC ($/kWh):	$0.07
Faucet Aerator Winter Off-pk Energy AC ($/kWh):	$0.06
Faucet Aerator Gas AC ($/therm):	$0.78
Night Light Demand AC ($/kW):	$77.03
Night Light Summer On-pk Energy AC ($/kWh):	$0.09
Night Light Summer Off-pk Energy AC ($/kWh):	$0.07
Night Light Winter On-pk Energy AC ($/kWh):	$0.08
Night Light Winter Off-pk Energy AC ($/kWh):	$0.07
Refrigerator Demand AC ($/kW):	$52.45
Refrigerator Summer On-pk Energy AC ($/kWh):	$0.06
Refrigerator Summer Off-pk Energy AC ($/kWh):	$0.04
Refrigerator Winter On-pk Energy AC ($/kWh):	$0.06
Refrigerator Winter Off-pk Energy AC ($/kWh):	$0.05
Administrative Cost:	NA
Discount Rate:	9.02%
Societal Discount Rate:	4.00%
NTG Ratio:	100%

RATE DATA	
Rate:	
$/kW:	0.00
$/kWh, On-Peak:	$0.11
$/kWh, Off-Peak:	$0.11

OPERATING DATA	
CFL On-Pk Op. Ratio:	23%
CFL Off-Pk Op. Ratio:	77%
Faucet Aerator On-Pk Op. Ratio:	30%
Faucet Aerator Off-Pk Op. Ratio:	70%
Night Light On-Pk Op. Ratio*:	0%
Night Light Off-Pk Op. Ratio*:	100%
Refrigerator Therm On-Pk Op. Ratio*:	25%
Refrig Therm Off-Pk Op. Ratio*:	75%
Summer Ratio:	50%
Winter Ratio:	50%
CFL 13 W Coincidence Factor:	8%
Faucet Aerator Coincidence Factor:	80%
LED Night Light Coincidence Factor:	0%
Refrigerator Coincidence Factor:	93%

OTHER FACTORS	
Line Loss Factor - Demand:	9.5%
Line Loss Factor - Energy:	9.5%
Capacity Reserve Margin:	0%
Application	Retrofit
Cost Basis:	Full Install

	DEMAND/ENERGY SAVINGS						INCENTIVE CALCULATIONS						CUSTOMER COST/SAVINGS				WGT.	% Incent	Societal
Unit Type	Annual Energy Savings (KWh)	Non Coin Demand Savings (kW)	Coincident Demand Savings (KW)	On-pk Energy Savings (KWh)	Off-pk Energy Savings (KWh)	Gas Energy Savings (Therms)	IRP PV Benefit ($)	Societal PV Benefit ($)	Recommended Incentive*** ($)	Recommended Incentive*** % PV	PV Program Cost ($)	NPV ($)	Incr. Cost*** ($)	Cost Savings ($)	Payback wo/ Inc. (yrs)	Payback w/ Inc. (yrs)	Weighting Factors for Program Cost	(%)	BC Ratio
2 CFLs (13 W)	91	0.099	0.008	21	70	N/A	28	32	14	49%	14	14	14	10	1.4	0.00	54%	100%	2.4
1 Bathroom Faucet Aerator	37	0.007	0.006	11	26	2	30	37	5	18%	5	24	5	4	1.4	0.00	22%	100%	6.9
1 LED Night Light	32	0.007	0.000	0	32	N/A	20	29	5	23%	5	16	5	3	1.4	0.00	19%	100%	6.0
1 Refrigerator Thermometer	9	0.001	0.001	2	6	N/A	1	1	1	98%	1	0	1	1	1.4	0.00	5%	100%	1.1
Total Kit (Measure Level)	168	0.114	0.015	34	134	2	79	100	25	32%	25	54	25	18	1.4	0.00	100%	100%	4.0

* The ratios are our best engineering assumptions, pending detailed MER work.

**DEER 2008.

***Based on UES 2011 Program Planning.

File Name: SchoolEducation_MAS_Res_UNSE_2010_12_10

APPENDIX H:

UNS Electric Measure Appendix

This information has been provided to Commission Staff electronically on a separate excel file and is available upon request to interested parties.

												Energy and Demand Savings per Unit							Measure Level Societal Cost Effectiveness (only includes Incremental Costs, no				
Sector	Existing/ New Measure	Program Name	RET/ ROB/ NC	End Use	Measure Name	Unit Basis	Baseline Product Description	Efficient Product Description	2011 Participation Units	2012 Participation Units	Measure Life (years)	Non-Coincident Demand (kW)	Coincident Demand (kW)	On Peak (kWh)	Off Peak (kWh)	Total Incremental Cost per unit	Proposed Incentive per unit	Incentive as % of Inc. Cost	Societal Benefits	Societal Costs	Net Societal Benefits	Societal Cost Test	Measure level annual CO2 savings (Metric Tons)
Commercial	New	Bid for Efficiency - Pilot	RET	Whole Building	Bid for Efficiency	per customer	baseline building	Bid projects	2	4	10	45.66	36.53	200,000	200,000	$80,000	$60,000	75%	$267,874	$80,000	$187,874	3.3	162.77
Commercial	New	Retro-Commissioning	RET	Whole Building	Retro-Commissioning	per 100K sqft	baseline building	custom actions	-	9	10	22.83	18.26	100,000	100,000	$29,333	$22,000	75%	$133,937	$29,333	$104,604	4.6	81.38
Commercial	New	C&I Facilities	RET	HVAC	Shade Screens	Per Sq Ft	no screens	shading coeff: 0.24	400	680	10	0.00	0.00	7	3	$4	$2	48%	$7	$4	$3	1.7	0.00
Commercial	New	C&I Facilities	RET	HVAC	Window Films	Per Sq Ft	no film	shading coeff: 0.578	400	680	15	0.00	0.00	3	1	$3	$2	76%	$6	$3	$4	2.5	0.00
Commercial	New	C&I Facilities	RET	Lighting	Induction Lighting	Per Lamp	229 W Metal Halide	96 W Induction lamp	5	9	18	0.16	0.15	218	233	$196	$140	71%	$682	$196	$486	3.5	0.18
Commercial	New	C&I Facilities	RET	Lighting	LED Channel Signs	Per Linear Ft	6W/ft Neon	1.2 W/ft LED	50	85	10	0.00	0.00	4	21	$13	$9	66%	$16	$13	$3	1.2	0.01
Commercial	New	C&I Facilities	RET	Lighting	Outdoor CFL	Per Lamp	112 W incand.	25 W CFL	250	425	5	0.09	0.00	87	295	$9	$2	20%	$102	$9	$93	11.9	0.16
Commercial	New	C&I Facilities	RET	Lighting	Reduced LPD	Per customer	1.21 W/sqft	1.09 W/sqft	2	4	12	4.69	4.37	7,733	8,232	$4,472	$0	0%	$15,006	$4,472	$10,534	3.4	6.50
Commercial	New	C&I Facilities	RET	Lighting	T8 to T8	Per Fixture	standard T8	premium T8	-	-	15	0.02	0.02	29	31	$59	$24	41%	$74	$59	$16	1.3	0.02
Commercial	New	C&I Facilities	RET	Lighting	Premium T8 Lighting	Per Fixture	T12 Lamps	Premium T8 Lamps	8,800	14,960	10	0.07	0.06	74	79	$59	$35	60%	$131	$59	$72	2.2	0.06
Commercial	New	C&I Facilities	RET	Plug Loads	Beverage Ctrls ("vending miser")	Per Sensor	no controls	occupancy sensors	10	17	12	0.15	0.15	414	1,196	$199	$74	37%	$1,248	$199	$1,049	6.3	0.66
Commercial	New	C&I Facilities	RET	Plug Loads	Snack Ctrls ("Vending Miser")	Per Sensor	no controls	occupancy sensors	10	17	12	0.03	0.03	83	239	$103	$74	72%	$250	$103	$147	2.4	0.13
Commercial	New	C&I Facilities	RET	Refrigeration	Refrigerated Display Automatic Door Closers	Per Door	standard doors	Automatic Door Closers	10	17	5	0.40	0.39	908	2,627	$142	$40	28%	$1,053	$142	$911	7.4	1.44
Commercial	New	C&I Facilities	RET	Refrigeration	Refrigerated Display Gaskets	Per Linear Ft	no action	Replace Gaskets	-	-	3	0.01	0.01	27	77	$12	$8	70%	$18	$12	$6	1.5	0.04
Commercial	New	C&I Facilities	RET	Plug Loads	Advanced Power Strips - Load Sensor	Per Sensor	standard strips	Smart Strips - Load Sensor	-	50	12	0.03	0.03	45	73	$32	$10	31%	$105	$32	$73	3.3	0.05
Commercial	New	C&I Facilities	RET	Plug Loads	Advanced Power Strips - Occupancy Sensors	Per Sensor	standard strips	Smart Strips - Occupancy Sensors	-	50	12	0.04	0.04	65	105	$90	$10	11%	$154	$90	$64	1.7	0.07
Commercial	New	C&I Facilities	RET	Plug Loads	Advanced Power Strips - Timer Plug Strip	Per Sensor	standard strips	Smart Strips - Timer Plug Strip	-	50	12	0.05	0.05	81	132	$19	$10	53%	$188	$19	$169	9.9	0.09
Commercial	New	C&I Schools	RET	Whole Building	Custom Measures	per customer	no action	custom actions	6	13	10	1.86	0.00	16,337	16,337	$6,535	$6,535	100%	$20,156	$6,535	$13,621	3.1	13.30
Commercial	New	C&I Schools	ROB	HVAC	14 SEER Packaged and Split Air Conditioners	Per Unit	SEER 13	SEER 14	-	-	15	0.23	0.20	215	343	$440	$440	100%	$702	$440	$262	1.6	0.23
Commercial	New	C&I Schools	ROB	HVAC	14 SEER Packaged and Split Heat Pumps	Per Unit	SEER 13	SEER 14	-	-	15	0.26	0.23	335	536	$440	$440	100%	$1,021	$440	$581	2.3	0.35
Commercial	New	C&I Schools	ROB	HVAC	15 SEER Packaged and Split Air Conditioners	Per Unit	SEER 13	SEER 15	-	-	15	0.12	0.10	401	640	$880	$880	100%	$1,060	$880	$179	1.2	0.42
Commercial	New	C&I Schools	ROB	HVAC	15 SEER Packaged and Split Heat Pumps	Per Unit	SEER 13	SEER 15	-	-	15	0.33	0.30	670	1,070	$880	$880	100%	$1,882	$880	$1,001	2.1	0.71
Commercial	New	C&I Schools	ROB	HVAC	16 SEER Packaged and Split Air Conditioners	Per Unit	SEER 13	SEER 16	-	-	15	0.30	0.27	563	900	$1,321	$1,321	100%	$1,600	$1,321	$279	1.2	0.60
Commercial	New	C&I Schools	ROB	HVAC	16 SEER Packaged and Split Heat Pumps	Per Unit	SEER 13	SEER 16	-	-	15	0.30	0.27	935	1,494	$1,321	$1,321	100%	$2,491	$1,321	$1,170	1.9	0.99
Commercial	New	C&I Schools	RET	HVAC	Programmable Thermostats	Per unit	non-programmable	programmable	30	65	11	0.00	0.00	-	5,688	$204	$204	100%	$3,469	$204	$3,265	17.0	2.31
Commercial	New	C&I Schools	RET	HVAC	Shade Screens	Per Sq Ft	no screens	shading coeff: 0.24	-	-	10	0.00	0.00	7	3	$4	$4	100%	$7	$4	$3	1.7	0.00
Commercial	New	C&I Schools	RET	HVAC	Window Films	Per Sq Ft	no film	shading coeff: 0.578	-	-	15	0.00	0.00	3	1	$3	$3	100%	$6	$3	$4	2.4	0.00
Commercial	New	C&I Schools	RET	Lighting	Daylighting controls	Per kW base load	no controls	daylighting controls	-	-	15	0.65	0.60	828	996	$751	$751	100%	$2,263	$751	$1,512	3.0	0.74
Commercial	New	C&I Schools	RET	Lighting	Delamping	Per Fixture	T8s and T12s	Remove T8s and T12s	90	194	15	0.09	0.08	121	145	$6	$6	100%	$325	$6	$318	51.1	0.11
Commercial	New	C&I Schools	RET	Lighting	Energy efficient exit signs	Per fixture	Incandescent-CFL sign	LED sign	75	162	16	0.06	0.06	265	319	$55	$55	100%	$645	$55	$590	11.7	0.24
Commercial	New	C&I Schools	RET	Lighting	Hard Wire CFL	Per Bulb	100 W Incandescent bulb	25 W CFL	60	129	2	0.06	0.06	45	55	$15	$15	100%	$17	$15	$2	1.1	0.04
Commercial	New	C&I Schools	RET	Lighting	HIDs to T8/T5	Per Fixture	400W Metal Halide	220 W T5/T8s	45	97	18	0.23	0.21	230	777	$96	$96	100%	$1,329	$96	$1,233	13.8	0.41
Commercial	New	C&I Schools	RET	Lighting	Induction Lighting	Per Lamp	229 W Metal Halide	96 W Induction lamp	-	-	18	0.16	0.15	205	246	$196	$196	100%	$679	$196	$483	3.5	0.18
Commercial	New	C&I Schools	RET	Lighting	Integral Screw In CFL	Per Bulb	71 W Incandescent bulb	16.6 W CFL	-	-	2	0.07	0.07	50	60	$11	$11	100%	$18	$11	$8	1.7	0.04
Commercial	New	C&I Schools	RET	Lighting	Occupancy sensors	Per sensor	no sensors	occupancy sensors	12	26	12	0.07	0.06	209	252	$96	$96	100%	$385	$96	$289	4.0	0.19
Commercial	New	C&I Schools	RET	Lighting	Outdoor CFL	Per Lamp	112 W incand.	27 W CFL	20	43	5	0.09	0.00	87	295	$9	$9	100%	$102	$9	$93	11.9	0.16
Commercial	New	C&I Schools	RET	Lighting	Reduced LPD	Per customer	1.21 W/sqft	1.09 W/sqft	-	-	12	4.69	4.37	7,249	8,716	$4,472	$4,472	100%	$14,930	$4,472	$10,457	3.3	6.50
Commercial	New	C&I Schools	RET	Lighting	Screw in cold cathode CFL	Per Bulb	30 W Incandescent bulb	6W CFL	-	-	6	0.04	0.00	44	150	$12	$12	100%	$64	$12	$52	5.2	0.08
Commercial	New	C&I Schools	RET	Lighting	Standard T8 Lighting	Per Fixture	T12 Lamps	Standard T8 Lamps	40	86	6	0.02	0.02	27	29	$31	$31	100%	$25	$31	($6)	0.8	0.02
Commercial	New	C&I Schools	RET	Lighting	Premium T8 Lighting	Per Fixture	T12 Lamps	Premium T8 Lamps	160	344	10	0.07	0.06	69	83	$59	$59	100%	$130	$59	$71	2.2	0.06
Commercial	New	C&I Schools	RET	Lighting	T8 to T8	Per Lamp	standard T8	premium T8	-	-	15	0.01	0.01	10	10	$21	$21	100%	$25	$21	$4	1.2	0.01
Commercial	New	C&I Schools	RET	Motors	Variable Speed Drives	per HP	no VSD	VSD	-	-	15	0.00	0.00	1,121	1,214	$377	$377	100%	$2,203	$377	$1,827	5.8	0.95
Commercial	New	C&I Schools	RET	Plug Loads	Beverage Ctrls ("vending miser")	Per Sensor	no controls	occupancy sensors	15	33	12	0.15	0.15	393	1,217	$199	$199	100%	$1,248	$199	$1,049	6.3	0.66
Commercial	New	C&I Schools	RET	Plug Loads	Snack Ctrls ("Vending Miser")	Per Sensor	no controls	occupancy sensors	15	33	12	0.03	0.03	79	243	$103	$103	100%	$250	$103	$147	2.4	0.13
Commercial	New	C&I Schools	RET	Plug Loads	Advanced Power Strips - Load Sensor	Per Sensor	standard strips	Smart Strips - Load Sensor	5	11	12	0.03	0.03	45	73	$32	$32	100%	$105	$32	$73	3.3	0.05
Commercial	New	C&I Schools	RET	Plug Loads	Advanced Power Strips - Occupancy Sensors	Per Sensor	standard strips	Smart Strips - Occupancy Sensors	-	-	12	0.04	0.04	65	105	$90	$90	100%	$155	$90	$65	1.7	0.07
Commercial	New	C&I Schools	RET	Plug Loads	Advanced Power Strips - Timer Plug Strip	Per Sensor	standard strips	Smart Strips - Timer Plug Strip	-	-	12	0.05	0.05	81	132	$19	$19	100%	$188	$19	$169	9.9	0.09

APPENDIX I:

UNS Electric School Facilities Program

Program Description

The UNS Electric, Inc. ("UNS Electric") School Facilities Program ("Program") is open to participation by all existing school facilities in the UNS Electric service territory, including charter schools. The proposed Program will utilize the same delivery method and pay incentives for the same demand side management ("DSM") measures as the existing UNS Electric Commercial Facilities Efficiency Program, but with a separate budget reserved for schools. Incentives for the Program will also be paid at a higher level than for the Efficiency Program.

- The Program will offer incentives for a select group of retrofit and replace-on-burnout ("ROB") energy efficiency measures in existing school facilities. The efficiency measures offered include high-efficiency lighting equipment upgrades, high-efficiency HVAC equipment, lighting controls, programmable thermostats, and selected refrigeration measures.
- The direct install component will utilize an on-line proposal generation and project tracking application to reduce the transaction costs. Proposed incentives for DSM measures are identical to the incentive structure in the UNS Electric Commercial Facilities Efficiency Program; however UNS Electric proposes to pay up to 100% of incremental costs for schools. The Program will have a separate incentive budget of $72,248 per year which is reserved exclusively for school use. If schools oversubscribe the budget, they will be allowed to request participation in the UNS Electric Commercial Facilities Efficiency Program which only pays up to 85% of incremental cost.

Program Objectives and Rationale

The primary goal of the Program is to encourage schools in UNS Electric's service territory to install energy efficiency measures in existing facilities. More specifically, the Program is designed to:

- Encourage schools to install high-efficiency lighting equipment and controls, HVAC equipment, and energy-efficient refrigeration system retrofits in their facilities (see **Error! Reference source not found.**, School Facilities Efficiency Incentive Summary, for the schedule of measures and incentives).
- Encourage contractors to promote the Program and provide turn-key installation services to schools.
- Assure that the participation process is clear, easy to understand and simple.
- Increase the awareness and knowledge of school facility managers and other decision-makers on the benefits of high-efficiency equipment and systems.

Since 2008, participation by schools in the UNS Electric Commercial Facilities Efficiency Program has been modest. In order to increase participation in energy efficiency retro-fits by schools, UNS Electric has developed this Program, which proposes to fund up to 100% of installed costs while engaging the contractor community to provide turn-key services. This is a 15% increase from the 85% allowed in the UNS Electric Commercial Facilities Program. The Schools Program will follow the design of the UNS Electric Commercial Facilities Efficiency Program because the direct-install concept has a proven track record of high participation and cost-effective life cycle savings for hard-to-reach markets, including schools.

Target Market

The target market for this Program is all kindergarten through twelfth grade ("K-12") public schools, including charter schools, in the UNS Electric service territory.

Program Eligibility

Customers must receive electric service from UNS Electric to be eligible for participation. For the purposes of this Program, school is defined as a "school entity." In the case of traditional public schools, a school entity is a public school district. In the case of a charter school, a school entity is one that has a state charter.

Current Baseline Conditions

Schools represent a market segment that has historically been underserved. This Program has been designed explicitly to increase the participation of schools in the UNS Electric DSM programs. Incentive levels and Program structure have been customized to address and overcome market barriers.

Products and Services Provided

The Program has an upstream market incentive design that provides incentives directly to installing contractors for the installation of energy efficiency measures. More specifically, the Program offers the following products and services:

- Educational and promotional pieces designed to assist contractors with marketing the Program to schools; and
- Education and promotional efforts for schools and contractor allies on how the Program functions, what energy efficiency technologies are offered, what incentives are provided and the benefits of the measures.

The lighting measures to be included in the Program are:

- T8 retrofits – retrofit of T12 fluorescent lighting with T8 lighting.
- Screw-in compact fluorescent light ("CFL") retrofits – replacement of incandescent lamps with screw-in fluorescent lamps.
- Exit sign retrofits – retrofit of incandescent and CFL exit signs with LED or electroluminescent exit signs lighting.
- Occupancy sensors – installation of occupancy sensor controls on lighting systems.
- De-lamping – de-lamping of lower efficiency fluorescent lighting fixtures or overlit areas.
- Reduced lighting power density ("LPD") – bringing lighting levels down to appropriate levels.
- High intensity discharge ("HID") lamps – to T8 or T5.
- Standard T8 to premium T8

The HVAC measures to be included in the Program are:

- High-efficiency AC/HP – installation of high-efficiency packaged air conditioners and heat pumps.
- Programmable thermostats – replacement of standard thermostats with programmable set-back thermostats.
- Shade screens and window films to reduce solar insolation.

The Program will also utilize variable speed drive motors to optimize performance, vending miser sensors, which turn off or turn down refrigeration and lighting on vending machines when not in use, and smart strips to better control plug loads. Whole Building custom incentive applications will also be considered where appropriate. Additionally, see Table 1 for a summary of the incentives offered for each of the Program measures.

Table 1. School Facilities Efficiency Incentive Summary

LIGHTING MEASURES	COST PER FIXTURE
Replace T12 Systems & Magnetic Ballasts w/ T8 Systems & Electronic Ballasts	$55/fixture
Energy Efficient Integral Compact Fluorescent Lighting	$11/lamp
Replace Incandescent and CFL Exit Signs	$55/sign
Install Occupancy Sensors on Lighting Fixtures	$96/sensor
Daylighting controls	$751/kW base load
Hard Wire CFL	$15/bulb
HIDs to T8/T5	$96/fixture
Induction Lighting	$196/lamp
Outdoor CFL	$9/lamp
Reduced LPD	$4,472/customer
Screw in cold cathode CFL	$12/bulb
T8 to T8	$21/lamp
Delamping	$6/fixture
HVAC MEASURES	
Programmable Thermostats	$204/thermostat
High-Efficiency Packaged AC and Heat Pumps (<65,000 Btuh)	$440 to $1,321 (depending on size and SEER rating)
Shade Screens	$4/sq. ft.
Window Films	$3/sq. ft.
MOTORS	
Variable speed drives	$377/HP
PLUG LOADS	
Beverage Controls ("Vending Miser")	$199/sensor
Snack Controls ("Vending Miser")	$103/sensor
Advanced Power Strips - Load Sensor	$32/strip
Advanced Power Strips - Occupancy Sensors	$90/strip
Advanced Power Strips - Timer Plug Strip	$19/strip
WHOLE BUILDING	
Custom measures	$6,535/customer

Program Delivery Strategy, Incentive Processing, and Administration

The Program is an upstream market incentive program that will utilize contractors to provide turn-key installation services to schools. The Program will be implemented by employing the same implementation contractor that delivers the UNS Electric Commercial Facilities Efficiency Program. Incentives will be paid directly to contractors and are designed to offset up to 100% of project installation costs. The participation process will be facilitated by an internet-based system that will provide an analysis of project savings, cost and cost savings and automated proposal preparation.

UNS Electric will assign an in-house program manager to oversee the Program, provide guidance on program activities that is consistent with UNS Electric's goals and customer service requirements, and

provide a contact point for schools that are interested in or have concerns about the Program. The implementation contractor will be responsible for program administration, application and incentive processing, monitoring the activities of the installing contractors, participation tracking and reporting, and overall quality control and management of the delivery process. As part of the implementation plan, the implementation contractor will conduct outreach to contractors, marketing and promotion to schools, and education and training on the benefits and functioning of the program.

The installing contractors will promote the program directly to schools, provide turn-key installation services and have access to the internet processing system to prepare proposals.

Program Marketing and Communications Strategy

The marketing and communications strategy will be designed to inform schools of the availability and benefits of the Program and how they can participate. The strategy will include specific outreach to schools and to contractors who typically do retrofits in schools. An important part of the marketing plan will be content and functionality on the UNS Electric website, which will direct schools to information about the Program. More specifically, the marketing and communications plan will include:

- Direct outreach to schools within the UNS Electric service territory;
- Direct outreach to existing trade allies that specifically target schools for the Program;
- Website content at uesaz.com providing Program information resources, contact information, and links to other relevant service and information resources;
- Customer care representatives will be available to answer any questions regarding the Program; and
- Presentations by the Program Manager and Implementation Contractor specifically targeted to schools.

Program Implementation Schedule

The Program will be implemented immediately upon Arizona Corporation Commission approval.

Measurement, Evaluation, and Research

UNS Electric will adopt a strategy that calls for integrated data collection that is designed to provide a quality data resource for program tracking, management and evaluation. This approach will entail the following primary activities:

- **Database management** - As part of program operation, UNS Electric will collect the necessary data elements to populate the tracking database and provide periodic reporting.
- **Integrated implementation data collection** – UNS Electric will work with the Implementation Contractor to establish systems to collect the data needed to support effective program management and evaluation through the implementation and customer application processes. The database tracking system will be integrated with implementation data collection processes.
- **Field verification** – UNS Electric will conduct field verification of the installation of a sample of measures throughout the implementation of the Program.
- **Tracking of savings using deemed savings values** – UNS Electric will develop deemed savings values for each measure and technology promoted by the Program and periodically review and revise the savings values to be consistent with program participation and accurately estimated the savings being achieved by the Program.

This approach will provide UNS Electric with ongoing feedback on program progress and enable program management to adjust or correct the program so as to be more effective, provide a higher level of service, and be more cost beneficial. Integrated data collection will also provide a high quality data resource for evaluation activities.

Quality Assurance and Control

Training on program rules and installation guidelines will be provided to interested contractors. Contractors will be made aware that their work may be inspected pre or post installation and that customer feedback on their performance will be solicited. The implementation contractor will randomly inspect at least 10% of all jobs to verify fixture counts, hours of use and functionality of the installed equipment.

Program Costs and Benefits

The annual budgets for 2011 and 2012 will be allocated as shown in Table 2. The 2011 budget as shown includes additional staff time required for new program start up. Any portion of the budget that is not expensed or reserved by the end of October may be transferred to the regular UNS Electric Commercial Facilities Efficiency Program.

Table 2. 2011 to 2012 Program Budget

Year	2011	2012
Total Budget	$162,513	$200,042
Incentives	$72,248	$156,411
Administrative Costs	$17,000	$3,003
Incentives as % of Budget	44%	78%

Total annual demand and energy savings goals are presented in Table 3. In addition to the savings shown in Table 3, it is estimated that the Program will produce the additional environmental benefits from 2011-2012, as shown in Table 4.

Table 3. Projected Capacity and Energy Benefits

Annual Incremental Savings	2011	2012
Coincident peak (MW)	0.05	0.12
Energy Savings (MWh)	596	1,291

Table 4. Projected Lifetime Environmental Benefits

Environmental Benefits	2011	2012
SOx (metric tons)	0.01	0.03
NOx (metric tons)	0.39	0.84
CO_2 (metric tons)	2,810	6,085

Table 5 provides program level benefit/cost analysis results. Measure level benefit-cost results assess cost-effectiveness on the basis of incremental costs only, while program level benefit-cost results assess both incremental costs and total program delivery costs. Measure level benefit-cost results are detailed in Appendix B.

Table 5. Benefit-Cost Analysis Results

Appendix I

Societal Cost Test BC Ratio	2011	2012
Total Program	2.5	4.4

Appendix I

2011 - 2012 Budget Detail

UNS Electric Schools Program (2011)				
Measure	**New or Existing Measure for 2011**	**Maximum Incentive / Measure**	**Units**	**TOTAL**
Custom Measures	New	$6,535	6	$39,209
14 SEER Packaged and Split Air Conditioners	New	$440		$0
14 SEER Packaged and Split Heat Pumps	New	$440		$0
15 SEER Packaged and Split Air Conditioners	New	$880		$0
15 SEER Packaged and Split Heat Pumps	New	$880		$0
16 SEER Packaged and Split Air Conditioners	New	$1,321		$0
16 SEER Packaged and Split Heat Pumps	New	$1,321		$0
Programmable Thermostats	New	$204	30	$6,133
Shade Screens	New	$4		$0
Window Films	New	$3		$0
Daylighting controls	New	$751		$0
Delamping	New	$6	90	$572
Energy efficient exit signs	New	$55	75	$4,133
Hard Wire CFL	New	$15	60	$902
HIDs to T8/T5	New	$96	45	$4,320
Induction Lighting	New	$196		$0
Integral Screw In CFL	New	$11		$0
LED Channel Signs	New	$13		$0
Occupancy sensors	New	$96	12	$1,152
Outdoor CFL	New	$9	20	$172
Reduced LPD	New	$4,472		$0
Screw in cold cathode CFL	New	$12		$0
T 8 Lighting	New	$55	200	$10,966
T8 to T8	New	$21		$0
Variable Speed Drives	New	$377		$0
Beverage Controls ("Vending Miser")	New	$199	15	$2,985
Snack Controls ("Vending Miser")	New	$103	15	$1,545
Advanced Power Strips - Load Sensor	New	$32	5	$160
Advanced Power Strips - Occupancy Sensors	New	$90		$0
Advanced Power Strips - Timer Plug Strip	New	$19		$0
Occupancy Sensor Vending Machine and Reach-in Cooler Controls	New	$199		$0
Subtotal Financial Incentives				**$72,248**
Program Delivery				
Utility Program Delivery				$45,000
IC Program Delivery				$13,014
Other Direct Costs (Office, Travel, Training Expenses)				$1,991
Subtotal Program Delivery				**$60,005**

Program Marketing				
Program Marketing				$7,009
Subtotal Program Marketing				**$7,009**
Utility Program Administration				
Utility Program Administration				$17,000
Subtotal Utility Program Administration				**$17,000**
Evaluation				
Measurement, Evaluation and Research				$6,250
Subtotal Evaluation				**$6,250**
Total Incentive				**$72,248**
Total Non-Incentive				**$90,265**
TOTAL				**$162,513**
Incentives as % of Total Budget				**44%**

UNS Electric C&I Schools Program (2012)				
Measure	**New or Existing Measure for 2011**	**Maximum Incentive / Measure**	**Units**	**TOTAL**
Custom Measures	New	$6,535	13	$84,952
14 SEER Packaged and Split Air Conditioners	New	$440		$0
14 SEER Packaged and Split Heat Pumps	New	$440		$0
15 SEER Packaged and Split Air Conditioners	New	$880		$0
15 SEER Packaged and Split Heat Pumps	New	$880		$0
16 SEER Packaged and Split Air Conditioners	New	$1,321		$0
16 SEER Packaged and Split Heat Pumps	New	$1,321		$0
Programmable Thermostats	New	$204	65	$13,289
Shade Screens	New	$4		$0
Window Films	New	$3		$0
Daylighting controls	New	$751		$0
Delamping	New	$6	194	$1,234
Energy efficient exit signs	New	$55	162	$8,926
Hard Wire CFL	New	$15	129	$1,939
HIDs to T8/T5	New	$96	97	$9,312
Induction Lighting	New	$196		$0
Integral Screw In CFL	New	$11		$0
Occupancy sensors	New	$96	26	$2,496
Outdoor CFL	New	$9	43	$369

Reduced LPD	New	$4,472		$0
Screw in cold cathode CFL	New	$12		$0
T 8 Lighting	New	$55	430	$23,577
T8 to T8	New	$21		$0
Variable Speed Drives	New	$377		$0
Beverage Controls ("vending miser")	New	$199	33	$6,567
Snack Controls ("Vending Miser")	New	$103	33	$3,399
Advanced Power Strips - Load Sensor	New	$32	11	$352
Advanced Power Strips - Occupancy Sensors	New	$90		$0
Advanced Power Strips - Timer Plug Strip	New	$19		$0
Subtotal Financial Incentives				**$156,411**
Program Delivery				
Utility Program Delivery				$7,949
IC Program Delivery				$13,404
Other Direct Costs (office, travel, and training expenses)				$2,051
Subtotal Program Delivery				**$23,404**
Program Marketing				
Program Marketing				$9,530
Subtotal Program Marketing				**$9,530**
Utility Program Administration				
Utility Program Administration				$3,003
Subtotal Utility Program Administration				**$3,003**
Evaluation				
Measurement, Evaluation and Research				$7,694
Subtotal Evaluation				**$7,694**
Total Incentive				**$156,411**
Total Non-Incentive				**$43,631**
TOTAL				**$200,042**
Incentives as % of Total Budget				**78%**

Appendix I

Measure Analysis Sheet for School Program Measures

Custom Measures
14 SEER Packaged and Split Air Conditioners
14 SEER Packaged and Split Heat Pumps
15 SEER Packaged and Split Air Conditioners
15 SEER Packaged and Split Heat Pumps
16 SEER Packaged and Split Air Conditioners
16 SEER Packaged and Split Heat Pumps
Programmable Thermostats
Shade Screens
Window Films
Daylighting controls
Delamping
Energy efficient exit signs
Hard Wire CFL
HIDs to T8/T5
Induction Lighting
Integral Screw In CFL
Occupancy sensors
Outdoor CFL
Reduced LPD
Screw in cold cathode CFL
T 8 Lighting
T8 to T8
Variable Speed Drives
Beverage Controls ("Vending Miser")
Snack Controls ("Vending Miser")
Advanced Power Strips - Load Sensor
Advanced Power Strips - Occupancy Sensors
Advanced Power Strips - Timer Plug Strip

Appendix I

Incentive Calculations
Custom Measures

Schools - Custom Measures

PROGRAM DATA	
Measure Life (yrs)**:	10
Program Life (yrs):	5
Demand AC ($/kW):	64.51
Summer On-pk Energy AC ($/kWh):	0.08
Summer Off-pk Energy AC ($/kWh):	0.06
Winter On-pk Energy AC ($/kWh):	0.07
Winter Off-pk Energy AC ($/kWh):	0.06
Program Administrative Costs ($/unit):	0
IRP Discount Rate:	9.02%
Social Discount Rate	4.00%
NTG Ratio:	100%

RATE DATA	
Res Ave	
$/kW:	0.00
$/kWh, On-Peak:	0.11
$/kWh, Off-Peak:	0.11

OPERATING DATA**	
Op Hours:	8,760
Summer Ratio:	50%
Winter Ratio:	50%
Coincidence Factor:	80%

OTHER FACTORS	
Line Loss Energy Factor:	9.5%
Line Loss Demand Factor:	9.5%
Capacity Reserve Factor:	0.0%
Application	RET
Cost Basis:	Full Installed

	DEMAND/ENERGY SAVINGS				INCENTIVE CALCULATIONS						CUSTOMER COST/SAVINGS				WGT.	% Incent	Societal
Measure Type	Non-Coincident Demand Savings (KW)	Coincident Demand Savings (kW)	OnPeak Energy Savings** (kWh)	OffPeak Energy Savings** (kWh)	IRP PV Benefit ($)	Social PV Benefit ($)	Recommended Incentive* ($)	% PV	PV Program Cost ($)	NPV ($)	Incr. Cost** ($)	Cost Savings ($)	Payback w o/Inc. (yrs)	Payback w /Inc. (yrs)	Weighting Factor**	(%)	BC Ratio
Per Customer	3.73	2.98	16,337	16,337	17,142	21,684	6,535	38%	6,535	10,607	6,535	3,582	1.8	0.0	100%	100%	3.3
Weighted Average	3.73	2.98	16,337	16,337	17,142	21,684	6,535	38%	6,535	10,607	6,535	3,582	1.8	0.0	100%	100%	3.3

*Incentive based on 2011 UES Program Planning.
**OnPk Off Pk Energy Savings, Operating Data, Weighting Factors, Incremental Costs, and Measure Life based on engineering assumptions based on past program data and program planning.

Appendix I

Schools Program - New HVAC

Incentive Calculations
NonRes Split and Packaged AC SEER-rated
13 SEER Baseline

PROGRAM DATA	
Conservation Life (yrs):	15
Program Life (yrs):	5
Demand AC ($/kW):	74.78
Summer On-pk Energy AC ($/kWh):	0.09
Summer Off-pk Energy AC ($/kWh):	0.07
Winter On-pk Energy AC ($/kWh):	0.08
Winter Off-pk Energy AC ($/kWh):	0.07
Program Admin Costs ($/unit):	NA
IRP Discount Rate:	9.02%
Social Discount Rate	4.00%
NTG Ratio:	100%

RATE DATA	
Rate Class:	
$/kW:	0.00
$/kWh, On-Peak:	0.11
$/kWh, Off-Peak:	0.11

OPERATING DATA	
On-Pk EFLH:	809
Off-Pk EFLH:	1292
On-Pk Ratio:	38%
Off-Pk Ratio:	62%
Summer Ratio:	78%
Winter Ratio:	22%
Coincidence Factor:	0.89
Equipment pk hr load factor:	1.00

OTHER FACTORS	
Line Loss Demand Factor:	9.5%
Line Loss Energy Factor:	9.5%
Capacity Reserve Factor:	0.0%
Application:	ROB
Cost Basis:	Incremental

		DEMAND/ENERGY SAVINGS								INCENTIVE CALCULATIONS						CUSTOMER COST/SAVINGS				WGT.	%Incent	Societal
Unit Type	Unit Size (Tons)	EE SEER	EE EER*	Base SEER	Base EER	Non-Coin Demand Savings Per Unit (KW)	Coin Demand Savings Per Unit (kWh)	On-pk Savings Per Unit (KWh)	Off-pk Savings Per Unit (KWh)	IRP PV Benefit ($)	Social PV Benefit ($)	Recommended Incentive (Per Unit)** ($)	Recommended Incentive (Per Unit)** %PV	PV Cost Per Unit ($)	NPV ($)	Incr. Cost Per Unit ($)	Cost Savings Per Ton ($)	Payback wo/Inc. (yrs)	Payback w/Inc. (yrs)	Weighting Factor*** (%)	%	BC Ratio
Packaged and Split	2	14	11.6	13	11.0	0.113	0.101	107	170	250	346	364	145%	364	-114	364	31	11.6	0.0	0%	100%	0.95
Air Conditioners	2.5	14	11.6	13	11.0	0.141	0.126	133	213	313	432	383	122%	383	-70	383	39	9.7	0.0	5%	100%	1.13
14 SEER	3	14	11.6	13	11.0	0.169	0.151	160	256	376	519	402	107%	402	-26	402	47	8.5	0.0	15%	100%	1.29
	3.5	14	11.6	13	11.0	0.197	0.176	187	298	438	605	421	96%	421	18	421	55	7.6	0.0	20%	100%	1.44
	4	14	11.6	13	11.0	0.226	0.201	213	341	501	692	439	88%	439	62	439	63	7.0	0.0	25%	100%	1.57
	5	14	11.6	13	11.0	0.282	0.251	267	426	626	865	477	76%	477	149	477	79	6.1	0.0	35%	100%	1.81
Weighted Average						0.227	0.202	215	343	504	696	440	90%	440	64	440	63	7.2	0.0	100%	100%	1.58
Packaged and Split	2	15	11.3	13	11.0	0.058	0.052	199	318	378	522	728	193%	728	-351	728	59	12.4	0.0	0%	100%	0.72
Air Conditioners	2.5	15	11.3	13	11.0	0.072	0.065	249	398	472	652	766	162%	766	-294	766	73	10.4	0.0	5%	100%	0.85
15 SEER	3	15	11.3	13	11.0	0.087	0.077	299	477	567	783	803	142%	803	-237	803	88	9.1	0.0	15%	100%	0.97
	3.5	15	11.3	13	11.0	0.101	0.090	348	557	661	913	841	127%	841	-180	841	103	8.2	0.0	20%	100%	1.09
	4	15	11.3	13	11.0	0.116	0.103	398	636	756	1,043	879	116%	879	-123	879	117	7.5	0.0	25%	100%	1.19
	5	15	11.3	13	11.0	0.145	0.129	498	795	945	1,304	954	101%	954	-9	954	147	6.5	0.0	35%	100%	1.37
Weighted Average						0.117	0.104	401	640	760	1,050	880	119%	880	-120	880	118	7.7	0.0	100%	100%	1.19
Packaged and Split	2	16	11.8	13	11.0	0.148	0.132	280	447	570	788	1,093	192%	1,093	-522	1,093	82	13.2	0.0	0%	100%	0.72
Air Conditioners	2.5	16	11.8	13	11.0	0.185	0.165	350	559	713	985	1,149	161%	1,149	-436	1,149	103	11.1	0.0	5%	100%	0.86
16 SEER	3	16	11.8	13	11.0	0.222	0.198	420	671	856	1,181	1,205	141%	1,205	-350	1,205	124	9.7	0.0	15%	100%	0.98
	3.5	16	11.8	13	11.0	0.259	0.231	490	783	998	1,378	1,262	126%	1,262	-263	1,262	144	8.7	0.0	20%	100%	1.09
	4	16	11.8	13	11.0	0.296	0.264	560	895	1,141	1,575	1,318	116%	1,318	-177	1,318	165	8.0	0.0	25%	100%	1.20
	5	16	11.8	13	11.0	0.370	0.330	700	1,118	1,426	1,969	1,430	100%	1,430	-5	1,430	206	6.9	0.0	35%	100%	1.38
Weighted Average						0.298	0.265	563	900	1,148	1,585	1,321	118%	1,321	-173	1,321	166	8.2	0.0	100%	100%	1.20
Packaged and Split	2	17	11.8	13	11.0	0.148	0.132	351	561	694	958	1,457	210%	1,457	-763	1,457	104	14.1	0.0	0%	100%	0.66
Air Conditioners	2.5	17	11.8	13	11.0	0.185	0.165	439	702	867	1,197	1,532	177%	1,532	-665	1,532	129	11.8	0.0	5%	100%	0.78
17 SEER	3	17	11.8	13	11.0	0.222	0.198	527	842	1,040	1,437	1,607	154%	1,607	-567	1,607	155	10.3	0.0	15%	100%	0.89
	3.5	17	11.8	13	11.0	0.259	0.231	615	982	1,214	1,676	1,682	139%	1,682	-468	1,682	181	9.3	0.0	20%	100%	1.00
	4	17	11.8	13	11.0	0.296	0.264	703	1,123	1,387	1,916	1,757	127%	1,757	-370	1,757	207	8.5	0.0	25%	100%	1.09
	5	17	11.8	13	11.0	0.370	0.330	878	1,404	1,734	2,395	1,907	110%	1,907	-173	1,907	259	7.4	0.0	35%	100%	1.26
Weighted Average						0.298	0.265	707	1,130	1,396	1,928	1,761	130%	1,761	-365	1,761	208	8.7	0.0	100%	100%	1.09
Packaged and Split	2	18	12.8	13	11.0	0.307	0.273	415	663	896	1,238	1,821	203%	1,821	-924	1,821	122	14.9	0.0	0%	100%	0.68
Air Conditioners	2.5	18	12.8	13	11.0	0.384	0.342	518	828	1,121	1,547	1,915	171%	1,915	-794	1,915	153	12.5	0.0	5%	100%	0.81
18 SEER	3	18	12.8	13	11.0	0.460	0.410	622	994	1,345	1,857	2,009	149%	2,009	-664	2,009	183	11.0	0.0	15%	100%	0.92
	3.5	18	12.8	13	11.0	0.537	0.478	726	1,160	1,569	2,166	2,103	134%	2,103	-534	2,103	214	9.8	0.0	20%	100%	1.03
	4	18	12.8	13	11.0	0.614	0.547	830	1,326	1,793	2,476	2,196	123%	2,196	-403	2,196	244	9.0	0.0	25%	100%	1.13
	5	18	12.8	13	11.0	0.767	0.684	1,037	1,657	2,241	3,095	2,384	106%	2,384	-143	2,384	306	7.8	0.0	35%	100%	1.30
Weighted Average						0.617	0.550	835	1,334	1,804	2,491	2,201	126%	2,201	-397	2,201	246	9.2	0.0	100%	100%	1.13

*EE EER value based on Efficient Home Cooling MER Report 2010
**Incentives based on UES 2011 Program Planning.
***Weighting Factors based on engineering assumptions.

Appendix I

Schools - New HVAC

Incentive Calculations
NonRes Split and Packaged HP SEER-rated
13 SEER Baseline

PROGRAM DATA	
Conservation Life (yrs):	15
Program Life (yrs):	5
Demand AC ($/ kW):	74.78
Summer On-pk Energy AC ($/ kWh):	0.09
Summer Off-pk Energy AC ($/ kWh):	0.07
Winter On-pk Energy AC ($/ kWh):	0.08
Winter Off-pk Energy AC ($/ kWh):	0.07
Program Admin Costs ($/ unit):	NA
IRP Discount Rate:	9.02%
Social Discount Rate	4.00%
NTG Ratio:	100%

RATE DATA	
Rate Class:	
$/ kW:	0.00
$/ kWh, On-Peak:	0.11
$/ kWh, Off-Peak:	0.11

OPERATING DATA	
On-Pk EFLH Cooling:	809
Off-Pk EFLH Cooling:	1292
On-Pk EFLH Heating:	554
Off-Pk EFLH Heating:	885
Summer Ratio:	54%
Winter Ratio:	46%
Coincidence Factor:	0.89
Equipment pk hr load factor:	1.00

OTHER FACTORS	
Line Loss Demand Factor:	9.5%
Line Loss Energy Factor:	9.5%
Capacity Reserve Factor:	0.0%
Application:	ROB, NEW
Cost Basis:	Incremental

		DEMAND/ ENERGY SAVINGS										INCENTIVE CALCULATIONS						CUSTOMER COST/ SAVINGS				WGT.	%Incent	Societal
Unit Type	Unit Size (Tons)	EE SEER	EE EER*	Base SEER	Base EER	EE HSPF	Base HSPF	Non-Coin Demand Savings Per Unit (kW)	Coin Demand Savings Per Unit (kW)	On-pk Savings Per Unit (KWh)	Off-pk Savings Per Unit (KWh)	IRP PV Benefit ($)	Social PV Benefit ($)	Recommended Incentive (Per Unit)** ($)	Recommended Incentive (Per Unit)** %PV	PV Cost Per Unit ($)	NPV ($)	Incr. Cost Per Unit ($)	Cost Savings Per Unit ($)	Payback wo/ Inc. (yrs)	Payback w/ Inc. (yrs)	Weighting Factor*** (%)	(%)	BC Ratio
Packaged and Split	2	14	11.7	13	11.0	8.30	8.00	0.131	0.116	167	266	364	503	364	100%	364	0	364	49	7.4	0.0	0%	100%	1.38
Heat Pump	2.5	14	11.7	13	11.0	8.30	8.00	0.163	0.145	208	333	455	629	383	84%	383	72	383	61	6.2	0.0	5%	100%	1.64
14 SEER	3	14	11.7	13	11.0	8.30	8.00	0.196	0.174	250	400	546	754	402	74%	402	145	402	74	5.5	0.0	15%	100%	1.88
	3.5	14	11.7	13	11.0	8.30	8.00	0.228	0.204	292	466	637	880	421	66%	421	217	421	86	4.9	0.0	20%	100%	2.09
	4	14	11.7	13	11.0	8.30	8.00	0.261	0.233	333	533	728	1,006	439	60%	439	289	439	98	4.5	0.0	25%	100%	2.29
	5	14	11.7	13	11.0	8.30	8.00	0.326	0.291	417	666	911	1,257	477	52%	477	434	477	123	3.9	0.0	35%	100%	2.64
	Weighted Average							0.263	0.234	335	536	733	1,012	440	62%	440	293	440	99	4.6	0.0	100%	100%	2.30
Packaged and Split	2	15	11.9	13	11.0	8.70	8.00	0.165	0.147	333	532	671	926	728	109%	728	-57	728	98	7.4	0.0	0%	100%	1.27
Heat Pump	2.5	15	11.9	13	11.0	8.70	8.00	0.206	0.184	416	665	839	1,158	766	91%	766	73	766	123	6.3	0.0	5%	100%	1.51
15 SEER	3	15	11.9	13	11.0	8.70	8.00	0.248	0.221	499	798	1,006	1,390	803	80%	803	203	803	147	5.5	0.0	15%	100%	1.73
	3.5	15	11.9	13	11.0	8.70	8.00	0.289	0.257	582	930	1,174	1,621	841	72%	841	333	841	172	4.9	0.0	20%	100%	1.93
	4	15	11.9	13	11.0	8.70	8.00	0.330	0.294	665	1,063	1,342	1,853	879	65%	879	463	879	196	4.5	0.0	25%	100%	2.11
	5	15	11.9	13	11.0	8.70	8.00	0.413	0.368	832	1,329	1,677	2,316	954	57%	954	724	954	245	3.9	0.0	35%	100%	2.43
	Weighted Average							0.332	0.296	670	1,070	1,350	1,865	880	67%	880	470	880	197	4.6	0.0	100%	100%	2.12
Packaged and Split	2	16	11.8	13	11.0	9.00	8.00	0.148	0.132	465	742	888	1,227	1,093	123%	1,093	-204	1,093	137	8.0	0.0	0%	100%	1.12
Heat Pump	2.5	16	11.8	13	11.0	9.00	8.00	0.185	0.165	581	928	1,110	1,533	1,149	103%	1,149	-39	1,149	171	6.7	0.0	5%	100%	1.33
16 SEER	3	16	11.8	13	11.0	9.00	8.00	0.222	0.198	697	1,113	1,332	1,840	1,205	90%	1,205	127	1,205	205	5.9	0.0	15%	100%	1.53
	3.5	16	11.8	13	11.0	9.00	8.00	0.259	0.231	813	1,299	1,554	2,146	1,262	81%	1,262	293	1,262	240	5.3	0.0	20%	100%	1.70
	4	16	11.8	13	11.0	9.00	8.00	0.296	0.264	929	1,485	1,776	2,453	1,318	74%	1,318	459	1,318	274	4.8	0.0	25%	100%	1.86
	5	16	11.8	13	11.0	9.00	8.00	0.370	0.330	1,161	1,856	2,220	3,066	1,430	64%	1,430	790	1,430	342	4.2	0.0	35%	100%	2.14
	Weighted Average							0.298	0.265	935	1,494	1,787	2,468	1,321	0.8	1,321	467	1,321	275	4.9	0.0	100%	100%	1.87
Packaged and Split	2	17	11.6	13	11.0	9.30	8.00	0.113	0.101	584	932	1,073	1,482	1,457	136%	1,457	-384	1,457	172	8.5	0.0	0%	100%	1.02
Heat Pump	2.5	17	11.6	13	11.0	9.30	8.00	0.141	0.126	729	1,166	1,341	1,852	1,532	114%	1,532	-191	1,532	215	7.1	0.0	5%	100%	1.21
17 SEER	3	17	11.6	13	11.0	9.30	8.00	0.169	0.151	875	1,399	1,609	2,222	1,607	100%	1,607	2	1,607	258	6.2	0.0	15%	100%	1.38
	3.5	17	11.6	13	11.0	9.30	8.00	0.197	0.176	1,021	1,632	1,877	2,593	1,682	90%	1,682	195	1,682	301	5.6	0.0	20%	100%	1.54
	4	17	11.6	13	11.0	9.30	8.00	0.226	0.201	1,167	1,865	2,146	2,963	1,757	82%	1,757	389	1,757	344	5.1	0.0	25%	100%	1.69
	5	17	11.6	13	11.0	9.30	8.00	0.282	0.251	1,459	2,331	2,682	3,704	1,907	71%	1,907	775	1,907	430	4.4	0.0	35%	100%	1.94
	Weighted Average							0.227	0.202	1,174	1,877	2,159	2,982	1,761	0.8	1,761	398	1,761	346	5.2	0.0	100%	100%	1.69
Packaged and Split	2	18	12.1	13	11.0	9.70	8.00	0.198	0.177	706	1,128	1,334	1,842	1,821	136%	1,821	-487	1,821	208	8.8	0.0	0%	100%	1.01
Heat Pump	2.5	18	12.1	13	11.0	9.70	8.00	0.248	0.221	882	1,410	1,668	2,303	1,915	115%	1,915	-247	1,915	260	7.4	0.0	5%	100%	1.20
18 SEER	3	18	12.1	13	11.0	9.70	8.00	0.298	0.265	1,059	1,692	2,001	2,764	2,009	100%	2,009	-7	2,009	312	6.4	0.0	15%	100%	1.38
	3.5	18	12.1	13	11.0	9.70	8.00	0.347	0.309	1,235	1,974	2,335	3,224	2,103	90%	2,103	232	2,103	364	5.8	0.0	20%	100%	1.53
	4	18	12.1	13	11.0	9.70	8.00	0.397	0.354	1,412	2,256	2,668	3,685	2,196	82%	2,196	472	2,196	416	5.3	0.0	25%	100%	1.68
	5	18	12.1	13	11.0	9.70	8.00	0.496	0.442	1,765	2,820	3,335	4,606	2,384	71%	2,384	951	2,384	520	4.6	0.0	35%	100%	1.93
	Weighted Average							0.399	0.356	1,421	2,270	2,685	3,708	2,201	0.8	2,201	484	2,201	419	5.4	0.0	100%	100%	1.68

*EE EER value based on Efficient Home Cooling MER Report 2010
**Incentives based on UES 2011 Program Planning.
***Weighting Factor based on engineering assumptions.

Appendix I

Schools Program - New HVAC

Incentive Calculations

Programmable Thermostats (Heating Setback / Cooling Setup)

PROGRAM DATA	
Measure Life (yrs)*:	11
Program Life (yrs):	5
Demand AC ($/kW):	66.44
Summer On-pk Energy AC ($/kWh):	0.08
Summer Off-pk Energy AC ($/kWh):	0.06
Winter On-pk Energy AC ($/kWh):	0.07
Winter Off-pk Energy AC ($/kWh):	0.07
Program Admin Costs ($/unit):	NA
Discount Rate:	9.02%
Social Discount Rate	4.00%
NTG Ratio:	100%

RATE DATA	
Rate Class:	
$/kW:	0.00
$/kWh, On-Peak:	0.11
$/kWh, Off-Peak:	0.11

OPERATING DATA**	
On-Pk Savings Ratio:	0%
Off-Pk Savings Ratio:	100%
Summer Ratio:	50%
Winter Ratio:	50%
Coincidence Factor:	0.00

OTHER FACTORS	
Line Loss Factor-Demand:	9.5%
line Loss Factor-Energy:	9.5%
Capacity Reserve Factor:	0%
Application:	RET
Cost Basis:	Full Installed

		DEMAND/ENERGY SAVINGS					INCENTIVE CALCULATIONS						CUSTOMER COST/ SAVINGS				WGT.	% Incent	Societal
Unit Type	Bldg Type	Bldg Area (sq.ft.)	Non-Coin. Demand Savings Per Tstat (KW)	Coin. Demand Savings Per Tstat (KW)	On-pk Savings Per Tstat (KWh)	Off-pk Savings Per Tstat (KWh)	IRP PV Benefit Per Tstat ($)	Social PV Benefit Per T stat ($)	Incentive (Per Tstat)*** ($)	Incentive (Per Tstat)*** %PV	PV Cost Per Tstat ($)	NPV ($)	Incr. Cost Per Tstat ($)	Cost Savings Per Tstat ($)	Payback wo/ Inc. (yrs)	Payback w/ Inc. (yrs)	Weighting Factor**	(%)	BC Ratio
Prog Therm	Education	374,999	0.00	0.00	0	5,688	2,668	3,438	204	8%	204	2,464	204	645	0.3	0.0	100%	100.0%	16.8
	Weighted Average	374,999	0.00	0.00	0	5,688	2,668	3,438	204	8%	204	2,464	204	645	0.3	0.0	100%	100.0%	16.8
Weighted Average Check		OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK

*Measure Lifetime based on DEER 2008 evaluations.

**Operating data, weighting factors based on engineering assumptions.

***Incentive based on 2011 Program Planning.

Appendix I

Incentive Calculations
Window Films

Schools - New HVAC

PROGRAM DATA	
Measure Life (yrs)*:	15
Program Life (yrs):	5
Demand AC ($/kW):	74.78
Summer On-pk Energy AC ($/kWh):	0.09
Summer Off-pk Energy AC ($/kWh):	0.07
Winter On-pk Energy AC ($/kWh):	0.08
Winter Off-pk Energy AC ($/kWh):	0.07
Program Administrative Costs ($/kWh)	NA
Discount Rate:	9.02%
Societal Discount Rate:	4.00%
NTG Ratio:	100%

RATE DATA	
Rate:	
$/kW:	0.00
$/kWh, On-Peal	0.11
$/kWh, Off-Peal	0.11

OPERATING DATA***	
On-Pk Op. Hours %	70%
Off-Pk Op. Hours %	30%
Summer Ratio:	100%
Winter Ratio:	0%
Coincidence Factor	100%

OTHER FACTORS	
Line Loss Factor - Demand:	9.5%
Line Loss Factor - Energy:	9.5%
Capacity Reserve Factor:	0%
Application	RET
Cost Basis:	Full Installed

		DEMAND/ENERGY SAVINGS					INCENTIVE CALCULATIONS						CUSTOMER COST/SAVINGS				WGT.	%Incent	Societal
Window Film	Emissivity	Shading Coefficient	Non Coin Demand Savings (kW)	Coincident Demand Savings (KW)	On-pk Energy Savings (KWh)	Off-pk Energy Savings (KWh)	IRP PV Benefit ($)	Societal PV Benefit ($)	Recommended Incentive** ($)	Recommended Incentive** %PV	PV Program Cost ($)	NPV ($)	Incr. Cost ($)	Cost Savings ($)	Payback wo/Inc. (yrs)	Payback w/Inc. (yrs)	Weighting Factor*** (%)	(%)	BC Ratio
Electric Cool/Heat																			
VS60	0.67	0.52	0.002	0.002	4	2	5	7	3	50%	3	5	3	0.62	4.3	0.0	15%	100%	2.8
VS61	0.67	0.58	0.002	0.002	3	1	5	6	3	58%	3	4	3	0.53	4.9	0.0	15%	100%	2.4
VS70	0.66	0.56	0.002	0.002	3	1	5	7	3	55%	3	4	3	0.56	4.7	0.0	15%	100%	2.5
VS80BL	0.82	0.65	0.001	0.001	3	1	4	5	3	70%	3	3	3	0.44	6.0	0.0	15%	100%	2.0
Electric Cool Only																			
VS60	0.67	0.52	0.002	0.002	4	2	5	7	3	51%	3	5	3	0.60	4.4	0.0	10%	100%	2.7
VS61	0.67	0.58	0.002	0.002	3	1	4	6	3	59%	3	4	3	0.52	5.0	0.0	10%	100%	2.4
VS70	0.66	0.56	0.002	0.002	3	1	5	6	3	56%	3	4	3	0.55	4.8	0.0	10%	100%	2.5
VS80BL	0.82	0.65	0.001	0.001	3	1	4	5	3	71%	3	2	3	0.43	6.1	0.0	10%	100%	1.9
Weighted Average			0.002	0.002	3	1	5	6	3	58%	3	4	3	0.53	5.01	0.00	100%	100%	2.4
Weighted Average Check				OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK

*Based on average of 3M warranty periods http://solutions.3m.com/wps/portal/3M/en_US/Window_Film/Solutions/Resources/Links/Warranties/
**Incentive based on 2011 UES Program Planning.
***Weighting Factor and Operating Data based on engineering assumptions.

Appendix I

Incentive Calculations
Daylighting Controls

Schools - New Lighting

PRGORAM DATA	
Measure Life (yrs):	15
Program Life (yrs):	5
Demand AC ($/kW):	74.78
Summer On-pk Energy AC ($/kWh):	0.09
Summer Off-pk Energy AC ($/kWh):	0.07
Winter On-pk Energy AC ($/kWh):	0.08
Winter Off-pk Energy AC ($/kWh):	0.07
Program Admin Costs ($/unit):	NA
Discount Rate:	9.02%
Social Discount Rate:	4.00%
NTG Ratio:	100%

RATE DATA	
Rate:	
$/kW:	0.00
$/kWh, On-Peak:	0.11
$/kWh, Off-Peak:	0.11

OPERATING DATA*	
On-Pk Op. Hours:	1,316
Off-Pk Op. Hours:	1,584
Total Hours:	2,900
Summer Ratio:	50%
Winter Ratio:	50%
Coincidence Factor:	0.93
HVAC Interaction Factor (Demand):	0.20
HVAC Interaction Factor (Energy):	0.17

OTHER FACTORS	
Line Loss Factor-Demand:	9.5%
Line Loss Factor-Energy:	9.5%
Capacity Reserve Factor:	0%
Application	RET / NEW
Cost Basis:	Full Installed

	DEMAND/ ENERGY SAVINGS						INCENTIVE CALCULATIONS						CUSTOMER COST/ SAVINGS				WGT.	%Incent	Societal
Control Type	Connected Load*** (Watts)	Dayl. Savings Fraction****	Non-Coin. Demand Savings Per kW (KW)	Coin. Demand Savings Per kW (KW)	On-pk Savings Per kW (KWh)	Off-pk Savings Per kW (KWh)	IRP PV Benefit Per kW ($)	Social PV Benefit Per KW ($)	Recommended Incentive** ($)	Recommended Incentive** %PV	PV Cost Per kW ($)	NPV ($)	Incr. Cost Per kW ($)	Cost Savings Per kW ($)	Payback wo/ Inc. (yrs)	Payback w/ Inc. (yrs)	Weighting Factor*****	(%)	BC Ratio
SIDELIGHTING - ON/ OFF	1000	32%	0.384	0.357	493	593	967	1335	775	1	775	191	775	123	6.3	0.0	10%	100%	1.7
SIDELIGHTING - STEP	1000	44%	0.528	0.491	678	815	1329	1836	775	1	775	554	775	169	4.6	0.0	10%	100%	2.4
SIDELIGHTING - CONTINUOU	1000	56%	0.672	0.625	862	1038	1692	2336	1358	1	1358	334	1358	215	6.3	0.0	20%	100%	1.7
SKYLIGHTING - ON/ OFF	1000	52%	0.624	0.580	801	964	1571	2169	176	0	176	1395	176	200	0.9	0.0	15%	100%	12.4
SKYLIGHTING - STEP	1000	57%	0.684	0.636	878	1056	1722	2378	176	0	176	1546	176	219	0.8	0.0	15%	100%	13.5
SKYLIGHTING - CONTINUOU	1000	62%	0.744	0.692	955	1149	1873	2586	905	0	905	968	905	239	3.8	0.0	30%	100%	2.9
Weighted Average	1000	54%	0.645	0.600	828	996	1624	2242	751	48%	751	873	751	207	3.7	0.0	100%	100%	3.0

*HVAC interaction factors from "Engineering Methods for Estimating the Impacts of DSM Programs, Volume 2: Fundamental Equations for Residential and Commercial End Uses," EPRI, 1993. This source shows a summer demand IC of 0.40.
**Incentives based on 2011 UES Program Planning.
***Connected load assumes 8 fixtures at 136 watts per fixture
****Daylighting Savings Fractions are sourced from Lawerence Berkely Labs Nomographs
*****Weighting factors based on engineering assumptions.

Weighted Average Check	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK

Appendix I

Schools - New Lighting

Incentive Calculations
Delamping
Removing lamps with no replacement

PROGRAM DATA	
Measure Life (yrs)*:	15
Program Life (yrs):	5
Demand AC ($/kW):	74.78
Summer On-pk Energy AC ($/kWh):	0.09
Summer Off-pk Energy AC ($/kWh):	0.07
Winter On-pk Energy AC ($/kWh):	0.08
Winter Off-pk Energy AC ($/kWh):	0.07
Program Admin Costs ($/kWh):	0
Discount Rate:	9.02%
Social Discount Rate	4.00%
NTG Ratio:	100%

RATE DATA	
Rate:	
$/kW:	0.00
$/kWh, On-Peak:	0.11
$/kWh, Off-Peak:	0.11

OPERATING DATA	
On-Pk Op. Hours:	1,447
Off-Pk Op. Hours:	1,741
Total Op. Hours:	3,187
Summer Ratio:	50%
Winter Ratio:	50%
Coincidence Factor:	0.93
HVAC Interaction Factor (Demand):	1.22
HVAC Interaction Factor (Energy):	1.15

OTHER FACTORS	
Line Loss Factor - Demand:	9.5%
Line Loss Factor - Energy:	9.5%
Capacity Reserve Factor:	0%
Application:	RET
Cost Basis:	Retrofit

		DEMAND/ ENERGY SAVINGS				INCENTIVE CALCULATIONS						CUSTOMER COST/ SAVINGS				WGT.	%Incent	Societal
Measure Type	Wghtd Base Watts	Non-Coincident Demand Savings (KW)	Coincident Demand Savings (KW)	On-pk Energy Savings (KWh)	Off-pk Energy Savings (KWh)	IRP PV Benefit ($)	Social PV Benefit ($)	Recommended Incentive** ($)	Recommended Incentive** %PV	PV Program Cost ($)	NPV ($)	Incr. Cost ($)	Cost Savings ($)	Payback wo/ Inc. (yrs)	Payback w/ Inc. (yrs)	Weighting Factor	(%)	BC Ratio
Delamping	72	0.161	0.149	121	145	277	383	6.36	2%	6	377	6.36	30	0.2	0.0	100%	100%	60.2

No Delamping took place in 2009 in UNSE service territory. Data replicates TEP MAS analysis, except for avoided costs and rate data.
* Based on DEER 2008 EUL of 70,000 (rate life of ballast)/ annual operating hours by building type or 15, whichever is lower.
**Based on 2011 UES Program Planning.

Schools - New Lighting

Incentive Calculations
Energy-Efficient Exit Signs – Retrofit Applications
Replace Inefficient Exit Signs with LED Exit Signs

PROGRAM DATA	
Measure Life (yrs)*:	16
Program Life (yrs):	5
Demand AC ($/kW):	77.03
Summer On-pk Energy AC ($/kWh):	0.09
Summer Off-pk Energy AC ($/kWh):	0.07
Winter On-pk Energy AC ($/kWh):	0.08
Winter Off-pk Energy AC ($/kWh):	0.07
Program Admin Costs ($/kWh):	0
Discount Rate:	9.02%
Social Discount Rate	4.00%
NTG Ratio:	100%

RATE DATA	
Rate:	
$/kW:	0.00
$/kWh, On-Peak:	0.11
$/kWh, Off-Peak:	0.11

OPERATING DATA	
On-Pk Op. Hours:	3,976
Off-Pk Op. Hours:	4,784
Total Op. Hours:	8,760
Summer Ratio:	50%
Winter Ratio:	50%
Coincidence Factor:	0.93
HVAC Interaction Factor (Demand):	1.10
HVAC Interaction Factor (Energy):	1.13

OTHER FACTORS	
Line Loss Factor - Demand:	9.5%
Line Loss Factor - Energy:	9.5%
Capacity Reserve Factor:	0%
Application	RET
Cost Basis:	Full Installed

			DEMAND/ ENERGY SAVINGS				INCENTIVE CALCULATIONS						CUSTOMER COST/ SAVINGS				WGT.	%Incent	Societal
Measure Type	EE Watts	Wghtd Base Watts	Non-Coincident Demand Savings (KW)	Coincident Demand Savings (KW)	On-pk Energy Savings (KWh)	Off-pk Energy Savings (KWh)	IRP PV Benefit ($)	Social PV Benefit ($)	Recommended Incentive** ($)	Recommended Incentive** %PV	PV Program Cost ($)	NPV ($)	Incr. Cost*** ($)	Cost Savings ($)	Payback wo/ Inc. (yrs)	Payback w/ Inc. (yrs)	Weighting Factor	(%)	BC Ratio
Weighted Average	5	64	0.124	0.115	265	319	494	693	55	11%	55	638	55.10	66	0.8	0.0	100%	100%	12.6

* Based on DEER 2008.
**Based on 2011 UES Program Planning.
***2010 MER Report.

Appendix I

Schools - New Lighting

Incentive Calculations
Integral Screw-In and Hardwire CFLs
Replace Incandescents with CFLs

PROGRAM DATA	
Measure Life (yrs)*:	2
Program Life (yrs):	5
Demand AC ($/kW):	50.92
Summer On-pk Energy AC ($/kWh):	0.06
Summer Off-pk Energy AC ($/kWh):	0.04
Winter On-pk Energy AC ($/kWh):	0.05
Winter Off-pk Energy AC ($/kWh):	0.05
Program Admin Costs ($/kWh):	0
Discount Rate:	9.02%
Social Discount Rate	4.00%
NTG Ratio:	100%

RATE DATA	
Rate:	
$/kW:	0.00
$/kWh, On-Peak:	0.11
$/kWh, Off-Peak:	0.11

OPERATING DATA	
On-Pk Op. Hours:	778
Off-Pk Op. Hours:	936
Total Op. Hours:	1,714
Summer Ratio:	50%
Winter Ratio:	50%
Coincidence Factor:	0.93
HVAC Interaction Factor (Demand):	1.22
HVAC Interaction Factor (Energy):	1.13

OTHER FACTORS	
Line Loss Factor - Demand:	9.5%
Line Loss Factor - Energy:	9.5%
Capacity Reserve Factor:	0%
Application	RET
Cost Basis:	Full Installed

			DEMAND/ ENERGY SAVINGS				INCENTIVE CALCULATIONS						CUSTOMER COST/ SAVINGS				WGT.	%Incent	Societal
Measure Type	CFL Fixt. Watts	Incand. Fixt. Watts	Non-Coincident Demand Savings (KW)	Coincident Demand Savings (KW)	On-pk Energy Savings (KWh)	Off-pk Energy Savings (KWh)	IRP PV Benefit ($)	Social PV Benefit ($)	Recommended Incentive** ($)	Recommended Incentive** %PV	PV Program Cost ($)	NPV ($)	Incr. Cost ($)	Cost Savings ($)	Payback wo/ Inc. (yrs)	Payback w/ Inc. (yrs)	Weighting Factor	(%)	BC Ratio
Integral Screw In	14	71	0.127	0.118	50	60	22	24	11	48%	11	13	11	13	0.8	0.0	100%	100%	2.3
Hardwire Plug In	16	67	0.115	0.107	45	55	20	22	15	78%	15	6	15	11	1.4	0.0	100%	100%	1.4

* Based on average manufacturer rated life and deemed annual usage hours.
**Based on 2011 UES Program Planning.

Appendix I

Incentive Calculations
ENERGY-EFFICIENT HID FIXTURES
Replace HID Systems with Linear Fluorescent T8 and T5 Systems

Schools - New Lighting

PROGRAM DATA	
Conservation Life (yrs):	18
Program Life (yrs):	5
Demand AC ($/kW):	81.72
Summer On-pk Energy AC ($/kWh):	0.09
Summer Off-pk Energy AC ($/kWh):	0.07
Winter On-pk Energy AC ($/kWh):	0.08
Winter Off-pk Energy AC ($/kWh):	0.08
Program Admin Costs ($/unit):	NA
IRP Discount Rate:	9.02%
Social Discount Rate	4.00%
NTG Ratio:	100%

RATE DATA	
Rate:	
$/kW:	0.00
$/kWh, On-Peak:	0.11
$/kWh, Off-Peak:	0.11

OPERATING DATA	
On-Pk Op. Hours:	999
Off-Pk Op. Hours:	3,381
Summer Ratio:	50%
Winter Ratio:	50%
Coincidence Factor:	0.93

OTHER FACTORS	
Line Loss Factor - Demand:	9.5%
Line Loss Factor - Energy:	9.5%
Capacity Reserve Factor:	0.0%
Application	RET
Cost Basis:	Full Installed

				DEMAND/ENERGY SAVINGS								INCENTIVE CALCULATIONS						CUSTOMER COST/SAVINGS				WGT.	%Incent	Societal
Base Fixture Type	Base Lamp Type	Base Lamp Watts	Base Fixt. Watts	EE Lamp Type***	EE Fixture Config***	EE Lamp Watts***	EE Fixt. Watts***	Non-Coincident Demand Savings (kW)	Coincident Demand Savings (kW)	On-pk Energy Savings (KWh)	Off-pk Energy Savings (KWh)	IRP PV Benefit ($)	Social PV Benefit ($)	Reccommended Incentives**** ($)	Reccommended Incentives**** %PV	PV Program Cost ($)	NPV ($)	Incr. Cost ($)	Cost Savings ($)	Payback wo/Inc. (yrs)	Payback w/ Inc. (yrs)	Weighting Factor*	(%)	BC Ratio
HID SYSTEMS	MH	150	185	F54T5/HO	2-Lamp	54	117	0.07	0.06	68	230	269	626	83	31%	83	187	83	34	2.4	0.0	0%	100%	7.6
	MH	250	290	F54T5/HO	3-Lamp	54	179	0.11	0.10	111	375	439	1,021	102	23%	102	337	102	55	1.9	0.0	5%	100%	10.0
	MH	400	468	F54T5/HO	4-Lamp	54	234	0.22	0.21	224	757	887	2,061	109	12%	109	778	109	111	1.0	0.0	35%	100%	18.9
	MH	750	810	F54T5/HO	6-Lamp	54	351	0.46	0.43	459	1,552	1,817	4,223	168	9%	168	1,648	168	228	0.7	0.0	1%	100%	25.1
	MH	1000	1080	2xF54T5/HO	4-Lamp	54	468	0.61	0.57	612	2,069	2,422	5,630	218	9%	218	2,204	218	304	0.7	0.0	2%	100%	25.8
								0.00		0	0													
	MH	150	185	F32T8	2-Lamp	32	72	0.11	0.11	113	382	447	1,040	42	9%	42	405	42	56	0.7	0.0	0%	100%	24.8
	MH	250	290	F32T8	3-Lamp	32	114	0.18	0.16	176	595	697	1,619	57	8%	57	639	57	87	0.7	0.0	5%	100%	28.2
	MH	400	458	F32T8	6-Lamp	32	219	0.24	0.22	239	808	946	2,199	74	8%	74	872	74	119	0.6	0.0	20%	100%	29.7
	MH	750	810	2x F32T8	6-Lamp	32	438	0.37	0.35	372	1,258	1,472	3,422	148	10%	148	1,324	148	185	0.8	0.0	1%	100%	23.1
	MH	1000	1080	2xF32T8	6-Lamp	32	438	0.64	0.60	641	2,170	2,541	5,906	148	6%	148	2,393	148	319	0.5	0.0	1%	100%	39.9
								0.00		0	0													
	HPS	150	190	F54T5/HO	2-Lamp	54	117	0.07	0.07	73	247	289	672	83	29%	83	206	83	36	2.3	0.0	0%	100%	8.1
	HPS	250	295	F54T5/HO	3-Lamp	54	179	0.12	0.11	116	392	459	1,067	102	22%	102	357	102	58	1.8	0.0	5%	100%	10.4
	HPS	400	464	F54T5/HO	4-Lamp	54	234	0.23	0.21	230	778	910	2,116	109	12%	109	801	109	114	1.0	0.0	10%	100%	19.4
								0.00		0	0													
	HPS	150	190	F32T8	2-Lamp	32	72	0.12	0.11	118	399	467	1,086	42	9%	42	425	42	59	0.7	0.0	0%	100%	25.9
	HPS	250	295	F32T8	3-Lamp	32	114	0.18	0.17	181	612	716	1,665	57	8%	57	659	57	90	0.6	0.0	5%	100%	29.0
	HPS	400	464	F32T8	6-Lamp	32	219	0.25	0.23	245	828	970	2,254	74	8%	74	896	74	122	0.6	0.0	10%	100%	30.4
Weighted Average		396	452			45	222	0.23	0.21	230	777	910	2,115	96	11%	96	814	96	114	0.9	0.0	100%	100%	22.0

*Weighting Factors based on engineering assumptions.
** HVAC interaction factors from "Engineering Methods for Estimating the Impacts of DSM Programs, Volume 2: Fundamental Equations for Residential and Commercial End Uses," EPRI, 1993. This source shows a summer demand IC of 0.40.
***See Energy Assumptions tab for more details.
****Incentives based on 2011 UES Program Planning.

Appendix I

Schools - New Lighting

Incentive Calculations
ENERGY-EFFICIENT INDUCTION LIGHTING
Replace HID Systems with Induction Lighting Systems

PROGRAM DATA	
Measure Life (yrs):	18
Program Life (yrs):	5
Demand AC ($/kW):	81.72
Summer On-pk Energy AC ($/kWh):	0.09
Summer Off-pk Energy AC ($/kWh):	0.07
Winter On-pk Energy AC ($/kWh):	0.08
Winter Off-pk Energy AC ($/kWh):	0.08
Program Admin Costs ($/unit):	NA
Discount Rate:	9.02%
Social Discount Rate:	4.00%
NTG Ratio:	100%

RATE DATA	
Rate:	
$/kW:	0.00
$/kWh, On-Peak:	0.11
$/kWh, Off-Peak:	0.11

OPERATING DATA**	
On-Pk Op. Hours:	1,316
Off-Pk Op. Hours:	1,584
Total Hours:	2,900
Summer Ratio:	50%
Winter Ratio:	50%
Coincidence Factor:	0.93
HVAC Interaction Factor (Demand)*:	0.20
HVAC Interaction Factor (Energy)*:	0.17

OTHER FACTORS	
Line Loss Factor (Demand):	9.5%
Line Loss Factor (Energy):	9.5%
Capacity Reserve Factor:	0%
Application	RET
Cost Basis:	Full Installed

				DEMAND/ENERGY SAVINGS								INCENTIVE CALCULATIONS						CUSTOMER COST/SAVINGS				WGT.	%Incent	Societal
Base Lamp Type	Base Lamp Watts	Base Fixt. Watts	EE Lamp Type	EE Lamp Watts	EE Fixt. Watts	Delta Lamp Watts	Delta Fixture Watts	Non-Coincident Demand Savings (kW)	Coincident Demand Savings (kW)	On-pk Energy Savings (kWh)	Off-pk Energy Savings (kWh)	IRP Benefit ($)	Societal PV Benefit ($)	Recommended Incentive*** ($)	Recommended Incentive*** %PV	PV Program Cost ($)	NPV ($)	Incr. Cost ($)	Cost Savings ($)	Payback wo/ Inc. (yrs)	Payback w/ Inc. (yrs)	Weighting Factor		BC Ratio
MH - 70W	70	94	Induction - 40 W	40	41	30	53	0.064	0.059	82	98	186	269	153	82%	153	33	153	20	7.5	0.0	6%	100%	1.8
MH - 100W	100	126	QL - 55W	55	56	45	70	0.084	0.078	108	129	244	353	146	60%	146	98	146	27	5.4	0.0	6%	100%	2.4
MH - 100W	100	126	ICETRON - 70W	70	71	30	55	0.065	0.061	84	101	190	276	146	77%	146	45	146	21	7.0	0.0	6%	100%	1.9
MH - 100W	100	126	QL - 85W	85	87	15	39	0.047	0.044	60	73	137	198	146	107%	146	-9	146	15	9.7	0.0	6%	100%	1.4
MH - 150W	150	185	QL - 55W	55	56	95	129	0.155	0.144	198	239	450	652	151	34%	151	299	151	50	3.1	0.0	6%	100%	4.3
MH - 150W	150	185	ICETRON - 70W	70	71	80	114	0.136	0.127	175	210	397	574	152	38%	152	245	152	44	3.5	0.0	6%	100%	3.8
MH - 150W	150	185	QL - 85W	85	87	65	98	0.118	0.110	151	182	343	497	152	44%	152	191	152	38	4.0	0.0	6%	100%	3.3
MH - 150W	150	185	ICETRON - 100W	100	102	50	83	0.099	0.092	128	154	290	419	159	55%	159	130	159	32	5.0	0.0	6%	100%	2.6
MH - 175W	175	210	QL - 85W	85	87	90	123	0.148	0.137	190	228	430	623	156	36%	156	275	156	47	3.3	0.0	6%	100%	4.0
MH - 175W	175	210	ICETRON - 100W	100	102	75	108	0.129	0.120	166	200	377	546	164	43%	164	213	164	42	3.9	0.0	6%	100%	3.3
MH - 250W	250	295	ICETRON - 150W	150	153	100	142	0.170	0.158	218	263	496	717	200	40%	200	296	200	55	3.7	0.0	6%	100%	3.6
MH - 250W	250	295	QL - 165W	165	169	85	126	0.152	0.141	195	234	442	640	208	47%	208	234	208	49	4.3	0.0	6%	100%	3.1
HPS - 150W	150	188	QL - 55W	55	56	95	132	0.158	0.147	203	244	461	667	253	55%	253	207	253	51	5.0	0.0	6%	100%	2.6
HPS - 150W	150	188	ICETRON - 70W	70	71	80	117	0.140	0.130	179	216	407	589	254	62%	254	154	254	45	5.7	0.0	6%	100%	2.3
HPS - 250W	250	295	QL - 85W	85	87	165	208	0.250	0.232	321	386	728	1,053	249	34%	249	479	249	80	3.1	0.0	6%	100%	4.2
HPS - 250W	250	295	ICETRON - 100W	100	102	150	193	0.231	0.215	297	357	674	976	257	38%	257	417	257	74	3.5	0.0	6%	100%	3.8
HPS - 400W	400	463	ICETRON - 150W	150	153	250	310	0.372	0.346	477	574	1,083	1,567	288	27%	288	795	288	119	2.4	0.0	6%	100%	5.4
HPS - 400W	400	463	QL - 165W	165	169	235	294	0.353	0.329	454	546	1,029	1,490	296	29%	296	733	296	113	2.6	0.0	6%	100%	5.0
Weighted Average								0.160	0.148	205	246	465	673	196	50%	196	269	196	51	4.6	0.0	100%	100%	3.4
Weighted Average Check								OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK

* HVAC interaction factors from "Engineering Methods for Estimating the Impacts of DSM Programs, Volume 2: Fundamental Equations for Residential and Commercial End Uses," EPRI, 1993. This source shows a summer demand IC of 0.40.
**Operation hours are based on HID swap outs for interior applications such as warehouses, showrooms, and corridors. However, induction lighting is found in outdoor applications such as tunnels, parking lots, street lights, which affect operation hours. This is still being researched.
***Incentive based on 2011 UES Program Planning.

Appendix I

Incentive Calculations
Occupancy Sensors
Install Occupancy Sensors on Lighting and Outdoor Fixtures

Schools - New Lighting

PROGRAM DATA	
Measure Life (yrs):	12
Program Life (yrs):	5
Demand AC ($/kW):	68.44
Summer On-pk Energy AC ($/kWh):	0.08
Summer Off-pk Energy AC ($/kWh):	0.06
Winter On-pk Energy AC ($/kWh):	0.08
Winter Off-pk Energy AC ($/kWh):	0.07
Program Admin Costs ($/unit):	NA
Discount Rate:	9.02%
Social Discount Rate	4.00%
NTG Ratio:	100%

RATE DATA	
Rate:	
$/kW:	0.00
$/kWh, On-Peak:	0.11
$/kWh, Off-Peak:	0.11

OPERATING DATA	
On-Pk Op. Hours:	1,316
Off-Pk Op. Hours:	1,584
Total Op. Hours:	2,900
Summer Ratio:	50%
Winter Ratio:	50%
Coincidence Factor:	0.93
HVAC Interaction Factor (Demand)*:	0.20
HVAC Interaction Factor (Energy)*:	0.17

OTHER FACTORS	
Line Loss Factor-Demand:	9.5%
Line Loss Factor-Energy:	9.5%
Capacity Reserve Factor:	0%
Application	RET / NEW
Cost Basis:	Full Installed

	DEMAND/ ENERGY SAVINGS									INCENTIVE CALCULATIONS						CUSTOMER COST/ SAVINGS				WGT.	%Incent	Societal
Space Type	Coverage Floor Area (SF)** per sensor	Lighting Power Density (Watts/SF)	Connected Load (Watts) per sensor	Energy Savings Factor	Demand Savings Factor	Non-Coin. Demand Savings Per Snsr (KW)	Coin. Demand Savings Per Snsr (KW)	On-pk Savings Per Snsr (KWh)	Off-pk Savings Per Snsr (KWh)	IRP PV Benefit Per Snsr ($)	Social PV Benefit Per Snsr ($)	Recommended Incentive (Per Snsr)*** ($)	Recommended Incentive (Per Snsr)*** %PV	PV Costs Per Snsr ($)	NPV ($)	Incr. Cost Per Snsr ($)	Cost Savings Per Snsr ($)	Payback wo/ Inc. (yrs)	Payback w/ Inc. (yrs)	Weighting Factor**	(%)	BC Ratio
Office (Open Plan)	300	1.3	390	26%	10%	0.05	0.04	154	185	214	280	96	45%	96	117	96	38	2.5	0.0	11%	100%	2.9
Office (Executive / Private)	150	1.5	225	31%	12%	0.03	0.03	107	129	149	195	96	65%	96	52	96	27	3.6	0.0	6%	100%	2.0
Corridor	200	0.7	140	39%	16%	0.03	0.02	84	101	117	153	96	83%	96	20	96	21	4.6	0.0	11%	100%	1.6
Classroom	500	1.6	800	32%	13%	0.12	0.12	398	479	553	726	96	17%	96	457	96	100	1.0	0.0	11%	100%	7.5
Restrooms	120	1.0	120	46%	18%	0.03	0.02	84	102	117	154	96	82%	96	21	96	21	4.6	0.0	11%	100%	1.6
Conference Room	300	1.5	450	37%	15%	0.08	0.07	257	309	357	468	96	27%	96	260	96	64	1.5	0.0	6%	100%	4.9
Warehouse	625	1.4	844	50%	20%	0.20	0.19	650	782	902	1184	96	11%	96	806	96	162	0.6	0.0	11%	100%	12.3
Mech / Elec Room	150	1.3	195	39%	16%	0.04	0.03	118	142	163	214	96	59%	96	67	96	29	3.3	0.0	11%	100%	2.2
Storage	150	1.1	165	48%	19%	0.04	0.03	121	145	168	220	96	58%	96	71	96	30	3.2	0.0	11%	100%	2.3
Copy Room	100	1.5	150	40%	16%	0.03	0.03	93	112	130	170	96	74%	96	33	96	23	4.1	0.0	11%	100%	1.8
Weighted Average	263	1.3	349	39%	16%	0.07	0.06	209	252	291	381	96	53%	96	194	96	52	3	0	100%	100%	4.0

*HVAC interaction factors from "Engineering Methods for Estimating the Impacts of DSM Programs, Volume 2: Fundamental Equations for Residential and Commercial End Uses," EPRI, 1993. This source shows a summer demand IC of 0.40.

**Coverage floor area, Weighting Factors from engineering judgment.

***Incentives based on UES 2011 Program Planning.

Appendix I

Incentive Calculations
High Efficiency Outdoor Lighting

Schools - New Lighting

PROGRAM DATA	
Measure Life (yrs):	5
Program Life (yrs):	5
Demand AC ($/kW):	55.65
Summer On-pk Energy AC ($/kWh):	0.07
Summer Off-pk Energy AC ($/kWh):	0.05
Winter On-pk Energy AC ($/kWh):	0.06
Winter Off-pk Energy AC ($/kWh):	0.05
Program Admin Cost ($/unit):	NA
Discount Rate:	9.02%
Social Discount Rate:	4.00%
NTG Ratio:	100%

RATE DATA	
Rate:	
$/kW:	0.00
$/kWh, On-Peak:	0.11
$/kWh, Off-Peak:	0.11

OPERATING DATA	
On-Pk Op. Hours:	999
Off-Pk Op. Hours:	3381
Total Hours:	4380
Summer Ratio:	50%
Winter Ratio:	50%
Coincidence Factor:	0.02

OTHER FACTORS	
Line Loss Factor-Demand:	9.5%
Line Loss Factor-Energy:	9.5%
Capacity Reserve Factor:	0%
Application	RET
Cost Basis:	Full Installed

DEMAND/ENERGY SAVINGS								INCENTIVE CALCULATIONS						CUSTOMER COST/SAVINGS				WGT.	%Incent	Societal
EE Measure Type	Base Measure Type	Base Fixture Watts	EE Fixture Watts	Non-Coin. Demand Savings (KW)	Coin. Demand Savings (KW)	On-pk Energy Savings (KWh)	Off-pk Energy Savings (KWh)	IRP PV Benefit ($)	Social PV Benefit ($)	Recommended Incentive** ($)	Recommended Incentive** %PV	PV Program Cost ($)	NPV ($)	Incr. Cost ($)	Cost Savings ($)	Payback wo/ Inc. (yrs)	Payback w/ Inc. (yrs)	Weighting Factor*	(%)	BC Ratio
CFL (screw-in, spiral)	Incandescent	40	9	0.031	0.001	31	105	31	36	6.56	21%	7	25	6.56	15	0.4	0.0	5%	100%	5.5
CFL (screw-in, spiral)	Incandescent	60	13	0.047	0.001	47	159	48	54	6.56	14%	7	41	6.56	23	0.3	0.0	11%	100%	8.3
CFL (screw-in, spiral)	Incandescent	75	18	0.057	0.001	57	193	58	66	6.56	11%	7	51	6.56	28	0.2	0.0	21%	100%	10.1
CFL (screw-in, spiral)	Incandescent	100	23	0.077	0.001	77	260	78	89	6.56	8%	7	71	6.56	38	0.2	0.0	32%	100%	13.6
CFL (screw-in, spiral)	Incandescent	150	32	0.118	0.002	118	399	119	137	7.89	7%	8	111	7.89	59	0.1	0.0	21%	100%	17.3
CFL (screw-in, spiral)	Incandescent	250	55	0.195	0.003	195	659	197	226	24.78	13%	25	172	24.78	97	0.3	0.0	10%	100%	9.1
	Weighted Average			0.087	0.001	87	295	88	101	8.59	10%	9	80	8.59	43	0.2	0.0	100%	100%	11.7
Weighted Average Check				OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK

*Weighting Factor based on engineering assumptions.
**Incentive based on 2011 UES Program Planning.

Appendix I

Incentive Calculations
REDUCED LIGHTING POWER DENSITY

Schools - New Lighting

PROGRAM DATA	
Measure Life (yrs):	12
Program Life (yrs):	5
Demand AC ($/ kW):	68.44
Summer On-pk Energy AC ($/ kWh):	0.08
Summer Off-pk Energy AC ($/ kWh):	0.06
Winter On-pk Energy AC ($/ kWh):	0.08
Winter Off-pk Energy AC ($/ kWh):	0.07
Program Admin Cost ($/ unit):	NA
Discount Rate:	9.02%
Societal Discount Rate:	4.00%
NTG Ratio:	100%

RATE DATA	
Rate:	
$/ kW:	0.00
$/ kWh, On-Peak:	0.11
$/ kWh, Off-Peak:	0.11

INCENTIVE LEVEL	
$ / kW reduced:	350

OPERATING DATA		Garage***
On-Pk Op. Hours: (Short / Long)	1,316	4380
Off-Pk Op. Hours: (Short / Long)	1,584	4380
Total Hours:	2,900	8760
Summer Ratio:	50%	
Winter Ratio:	50%	
Coincidence Factor:	0.93	
HVAC Interaction Factor (Demand)*****:	0.20	
HVAC Interaction Factor (Energy)*****:	0.17	

OTHER FACTORS	
Line Loss Factor - Demand:	9.5%
Line Loss Factor - Energy	9.5%
Capacity Reserve Factor:	0%
Application	NEW
Cost Basis:	Incremental

	DEMAND/ ENERGY SAVINGS								INCENTIVE CALCULATIONS						CUSTOMER COST/ SAVINGS				WGT.	% Incent	Societal
Building Type	Floor Area Sq.Ft.*	Baseline LPD** (Watts/ SF)	EE LPD (Watts/ SF)	LPD Savings Factor	Non-Coin. Demand Savings (KW)	Coin. Demand Savings (KW)	On-pk Savings (KWh)	Off-pk Savings (KWh)	IRP PV Benefit ($)	Societal PV Benefit ($)	Recommended Incentive**** ($)	Recommended Incentive**** %PV	PV Costs Per Prjct ($)	NPV ($)	Incr. Cost Per Prjct ($)	Cost Savings Per Prjct ($)	Payback wo/ Inc. (yrs)	Payback w/ Inc. (yrs)	Weighting Factor*****	(%)	BC Ratio
Automotive	6,500	0.9	0.8	10%	0.7	0.7	1,081	1,301	1,683	2,208	880	52%	880	804	880	270	3.3	0.0	0%	100%	2.5
Convention Center	21,900	1.2	1.1	10%	3.2	2.9	4,857	5,843	7,562	9,920	2,964	39%	2,964	4,598	2,964	1,214	2.4	0.0	0%	100%	3.3
Court House	15,500	1.2	1.1	10%	2.2	2.1	3,437	4,136	5,352	7,021	2,098	39%	2,098	3,254	2,098	859	2.4	0.0	0%	100%	3.3
Dining: Bar Lounge/Leisure	5,600	1.3	1.2	10%	0.9	0.8	1,345	1,619	2,095	2,748	758	36%	758	1,337	758	336	2.3	0.0	12%	100%	3.6
Dining: Cafeteria/Fast Food	5,600	1.4	1.3	10%	0.9	0.9	1,449	1,743	2,256	2,959	758	34%	758	1,498	758	362	2.1	0.0	9%	100%	3.9
Dining: Family	5,600	1.6	1.4	10%	1.1	1.0	1,656	1,992	2,578	3,382	758	29%	758	1,820	758	414	1.8	0.0	1%	100%	4.5
Dormitory	35,800	1	0.9	10%	4.3	4.0	6,616	7,960	10,301	13,514	4,845	47%	4,845	5,456	4,845	1,653	2.9	0.0	1%	100%	2.8
Exercise Center	14,200	1	0.9	10%	1.7	1.6	2,624	3,157	4,086	5,360	1,922	47%	1,922	2,164	1,922	656	2.9	0.0	0%	100%	2.8
Gymnasium	14,200	1.1	1.0	10%	1.9	1.7	2,887	3,473	4,494	5,896	1,922	43%	1,922	2,573	1,922	721	2.7	0.0	0%	100%	3.1
Health Care-Clinic	10,400	1	0.9	10%	1.2	1.2	1,922	2,312	2,992	3,926	1,407	47%	1,407	1,585	1,407	480	2.9	0.0	2%	100%	2.8
Hospital	241,400	1.2	1.1	10%	34.8	32.3	53,536	64,411	83,349	109,350	32,669	39%	32,669	50,681	32,669	13,376	2.4	0.0	9%	100%	3.3
Hotel	35,800	1	0.9	10%	4.3	4.0	6,616	7,960	10,301	13,514	4,845	47%	4,845	5,456	4,845	1,653	2.9	0.0	2%	100%	2.8
Library	14,200	1.3	1.2	10%	2.2	2.1	3,412	4,105	5,311	6,968	1,922	36%	1,922	3,390	1,922	852	2.3	0.0	0%	100%	3.6
Manufacturing Facility	21,900	1.3	1.2	10%	3.4	3.2	5,262	6,330	8,192	10,747	2,964	36%	2,964	5,228	2,964	1,315	2.3	0.0	0%	100%	3.6
Motel	35,800	1	0.9	10%	4.3	4.0	6,616	7,960	10,301	13,514	4,845	47%	4,845	5,456	4,845	1,653	2.9	0.0	3%	100%	2.8
Motion Picture Theater	14,200	1.2	1.1	10%	2.0	1.9	3,149	3,789	4,903	6,432	1,922	39%	1,922	2,981	1,922	787	2.4	0.0	0%	100%	3.3
Museum	14,200	1.1	1.0	10%	1.9	1.7	2,887	3,473	4,494	5,896	1,922	43%	1,922	2,573	1,922	721	2.7	0.0	0%	100%	3.1
Office	14,800	1	0.9	10%	1.8	1.7	2,735	3,291	4,258	5,587	2,003	47%	2,003	2,256	2,003	683	2.9	0.0	27%	100%	2.8
Parking Garage***	21,900	0.3	0.3	10%	0.7	0.6	2,878	2,878	3,581	4,698	773	22%	773	2,808	773	653	1.2	0.0	1%	100%	6.1
Performing Arts Theater	14,200	1.6	1.4	10%	2.7	2.5	4,199	5,052	6,537	8,577	1,922	29%	1,922	4,616	1,922	1,049	1.8	0.0	1%	100%	4.5
Police/Fire Station	15,500	1	0.9	10%	1.9	1.7	2,865	3,446	4,460	5,851	2,098	47%	2,098	2,362	2,098	716	2.9	0.0	0%	100%	2.8
Post Office	14,200	1.1	1.0	10%	1.9	1.7	2,887	3,473	4,494	5,896	1,922	43%	1,922	2,573	1,922	721	2.7	0.0	0%	100%	3.1
Religious Building	10,100	1.3	1.2	10%	1.6	1.5	2,427	2,919	3,778	4,956	1,367	36%	1,367	2,411	1,367	606	2.3	0.0	1%	100%	3.6
Retail (Other Than Mall)	9,700	1.4	1.3	10%	1.6	1.5	2,510	3,020	3,907	5,126	1,313	34%	1,313	2,595	1,313	627	2.1	0.0	29%	100%	3.9
Sports Arena	185,440	1.1	1.0	10%	24.5	22.8	37,698	45,356	58,692	77,001	25,096	43%	25,096	33,596	25,096	9,419	2.7	0.0	0%	100%	3.1
Town Hall	15,500	1.1	1.0	10%	2.0	1.9	3,151	3,791	4,906	6,436	2,098	43%	2,098	2,808	2,098	787	2.7	0.0	0%	100%	3.1
Transportation	21,900	1	0.9	10%	2.6	2.4	4,047	4,869	6,301	8,267	2,964	47%	2,964	3,338	2,964	1,011	2.9	0.0	0%	100%	2.8
Warehouse	16,900	0.8	0.7	10%	1.6	1.5	2,499	3,006	3,890	5,104	2,287	59%	2,287	1,603	2,287	624	3.7	0.0	1%	100%	2.2
Workshop	6,500	1.4	1.3	10%	1.1	1.0	1,682	2,023	2,618	3,435	880	34%	880	1,739	880	420	2.1	0.0	0%	100%	3.9
Weighted Average	33,223	1.2	1.1	10%	4.7	4.4	7,249	8,716	11,277	14,795	4,472	39%	4,472	6,804	4,472	1,811	2.4	0.0	100%	100%	3.3
Weighted Average Check	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK

* 2003 CBECS Detailed Tables, released June 2006, BECS Table B1. Summary Table: Total and Means of Floorspace, Number of Workers, and Hours of Operation for Non-Mall Buildings, 2003

**ANSI/ ASHRAE/ IESNA Standard 90.1-2004, Table 9.5.1 Lighting Power Densities Using the Building Area Method

***Incremental costs for parking garages include ratio for lower power densities and fixture count; Parking garages do not include interactive demand or energy effects.

****Incentives based on 2011 UES Program Planning.

*****HVAC Interaction Factors and Weighting Factors based on engineering assumptions.

Appendix I

Incentive Calculations

Schools - New Lighting

ENERGY-EFFICIENT COLD CATHODE FLUORESCENT LIGHTING (CC CFL)

PROGRAM DATA	
Measure Life (yrs):	6
Program Life (yrs):	5
Demand AC ($/kW):	57.31
Summer On-pk Energy AC ($/kWh)	0.07
Summer Off-pk Energy AC ($/kWh)	0.05
Winter On-pk Energy AC ($/kWh):	0.06
Winter Off-pk Energy AC ($/kWh):	0.06
Program Admin Costs ($/unit):	NA
Discount Rate:	9.02%
Societal Discount Rate:	4.00%
NTG Ratio:	100%

RATE DATA	
Rate:	
$/kW:	0.00
$/kWh, On-Peak:	0.11
$/kWh, Off-Peak:	0.11

OPERATING DATA	
On-Pk Op. Hours:	999
Off-Pk Op. Hours:	3,381
Total Hours	4,380
Summer Ratio:	50%
Winter Ratio:	50%
Coincidence Factor:	0.02

OTHER FACTORS	
Line Loss Factor - Demand:	9.5%
Line Loss Factor - Energy:	9.5%
Capacity Reserve Factor:	0%
Application	RET
Cost Basis:	Full

	DEMAND/ENERGY SAVINGS						INCENTIVE CALCULATIONS						CUSTOMER COST/SAVINGS				WGT.	%Incent	Societal
Fixture Type	Inc. Fixture Watts	Cold Cathode Fixture Watts	Non-Coincident Demand Savings (KW)	Coincident Demand Savings (KW)	On-pk Energy Savings (KWh)	Off-pk Energy Savings (KWh)	IRP PV Benefit ($)	Social PV Benefti ($)	Recommended Incentive** ($)	Recommended Incentive** %PV	PV Program Cost ($)	NPV ($)	Incr. Cost ($)	Cost Savings ($)	Payback wo/ Inc. (yrs)	Payback w/ Inc. (yrs)	Weighting Factor*	(%)	BC Ratio
SCREW-IN	25	3	0.022	0.000	22	74	27	31	12.46	46%	12	14	12	11	1.1	0.0	10%	100%	2.5
	30	5	0.025	0.000	25	85	31	36	11.01	36%	11	20	11	12	0.9	0.0	2%	100%	3.2
	40	5	0.035	0.001	35	118	43	50	11.01	26%	11	32	11	17	0.6	0.0	30%	100%	4.5
	45	8	0.037	0.001	37	125	45	53	13.15	29%	13	32	13	18	0.7	0.0	2%	100%	4.0
	50	8	0.042	0.001	42	142	51	60	13.15	26%	13	38	13	21	0.6	0.0	2%	100%	4.6
	54	8	0.046	0.001	46	156	56	66	13.15	23%	13	43	13	23	0.6	0.0	2%	100%	5.0
	60	8	0.052	0.001	52	176	64	74	13.15	21%	13	50	13	26	0.5	0.0	40%	100%	5.7
	65	8	0.057	0.001	57	193	70	82	13.15	19%	13	57	13	28	0.5	0.0	2%	100%	6.2
	75	8	0.067	0.001	67	227	82	96	13.15	16%	13	69	13	33	0.4	0.0	10%	100%	7.3
Weighted Average			0.044	0.001	44	150	54	63	12.40	25%	12	42	12	22	0.61	0.00	100%	100%	5.1
Weighted Average Check			OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK

*Weighting Factor based on engineering assumption. Measure Life based on lifetime assumption of 25000 hours.

**Incentive based on UES 2011 Program Planning.

Appendix I

Schools - New Lighting

Incentive Calculations

Energy-Efficient Fluorescent Fixtures – Retrofit Applications

Replace T12 Systems and Magnetic Ballasts with T8 Systems and Electronic Ballasts

PROGRAM DATA	
Measure Life (yrs)*:	15
Program Life (yrs):	5
Demand AC ($/ kW):	74.78
Summer On-pk Energy AC ($/ kWh):	0.09
Summer Off-pk Energy AC ($/ kWh):	0.07
Winter On-pk Energy AC ($/ kWh):	0.08
Winter Off-pk Energy AC ($/ kWh):	0.07
Program Admin Costs ($/ kWh):	0
Discount Rate:	9.02%
Social Discount Rate	4.00%
NTG Ratio:	100%

RATE DATA	
Rate:	
$/ kW:	0.00
$/ kWh, On-Peak:	0.11
$/ kWh, Off-Peak:	0.11

OPERATING DATA	
On-Pk Op. Hours:	1,320
Off-Pk Op. Hours:	1,405
Total Op. Hours:	2,725
Summer Ratio:	50%
Winter Ratio:	50%
Coincidence Factor:	0.95
HVAC Interaction Factor (Demand):	1.07
HVAC Interaction Factor (Energy):	1.11

OTHER FACTORS	
Line Loss Factor - Demand:	9.5%
Line Loss Factor - Energy:	9.5%
Capacity Reserve Factor:	0%
Application	RET
Cost Basis:	Full Installed

				DEMAND/ ENERGY SAVINGS						INCENTIVE CALCULATIONS						CUSTOMER COST/ SAVINGS				WGT.	% Incent	Societal
Measure Type	Length (ft)	# of Lamps in Fixture	Ballast Type	Base Fxt. Watts	EE Lamp Watts	EE Fxt. Watts	Non-Coincident Demand Savings (KW)	Coincident Demand Savings (KW)	On-pk Energy Savings (KWh)	Off-pk Energy Savings (KWh)	IRP PV Benefit ($)	Social PV Benefit ($)	Recommended Incentive*** ($)	Recommended Incentive*** %PV	PV Program Cost ($)	NPV ($)	Incr. Cost** ($)	Cost Savings ($)	Payback wo/ Inc. (yrs)	Payback w/ Inc. (yrs)	Weighting Factor	(%)	BC Ratio
Standard T8s	2	2	High Power	48	17	35	0.026	0.025	18	20	42	58	46.75	111%	47	11	46.75	4	10.8	0.0	0.03%	100%	1.2
	4	1	Standard	48	32	34	0.030	0.028	21	22	48	67	37.78	78%	38	29	37.78	5	7.6	0.0	1.72%	100%	1.8
			High Power	48	32	39	0.019	0.018	13	14	30	41	38.81	129%	39	3	38.81	3	12.6	0.0	0.21%	100%	1.1
		2	Standard	84	32	63	0.042	0.040	30	31	68	93	41.27	61%	41	52	41.27	7	6.0	0.0	27.27%	100%	2.3
			High Power	84	32	79	0.010	0.010	7	8	16	23	42.89	260%	43	-20	42.89	2	25.4	0.0	6.42%	100%	0.5
		3	Low Power	103	32	84	0.039	0.037	28	30	63	88	62.44	98%	62	25	62.44	7	9.6	0.0	63.62%	100%	1.4
		4	Standard	144	32	124	0.040	0.039	29	31	66	91	47.91	73%	48	43	47.91	7	7.1	0.0	0.73%	100%	1.9
Weighted Average				96	32	77	0	0	27	29	61	85	54.83	98%	55	30	54.83	6	9.6	0.0	100%	100%	1.5

* Measure life based on DEER 2008 EUL data

** Incremental cost is total cost for a new T8 under the assumption that customers do not buy new T12 fixtures/ lamps

***Incentive based on 2011 UES Program Planning.

Appendix I

Schools - New Lighting

Incentive Calculations
Energy-Efficient Fluorescent Fixtures
Replace Standard T8 Systems with Premium T8 Systems

PROGRAM DATA	
Measure Life (yrs)*:	15
Program Life (yrs):	5
Demand AC ($/kW):	74.78
Summer On-pk Energy AC ($/kWh):	0.09
Summer Off-pk Energy AC ($/kWh):	0.07
Winter On-pk Energy AC ($/kWh):	0.08
Winter Off-pk Energy AC ($/kWh):	0.07
Program Admin Costs ($/kWh, saved)	NA
Discount Rate:	9.02%
Social Discount Rate	4.00%
NTG Ratio:	100%

RATE DATA	
Rate:	
$/kW:	0.00
$/kWh, On-Peak:	0.11
$/kWh, Off-Peak:	0.11

OPERATING DATA	
On-Pk Op. Hours:	1,320
Off-Pk Op. Hours:	1,405
Total Op. Hours:	2,725
Summer Ratio:	50%
Winter Ratio:	50%
Coincidence Factor:	0.93
HVAC Interaction Factor (Demand):	1.07
HVAC Interaction Factor (Energy):	1.11

OTHER FACTORS	
Line Loss Factor - Demand:	9.5%
Line Loss Factor - Energy:	9.5%
Capacity Reserve Factor:	0%
Application	RET
Cost Basis:	Full Installed

			DEMAND/ ENERGY SAVINGS										INCENTIVE CALCULATIONS						CUSTOMER COST/ SAVINGS				WGT.	% Incent	Societal
Measure Type	Length	# of Lamps in Fixture	Base Lamp Type	Base Lamp Watts	Base Fixt. Watts	EE Lamp Type	EE Lamp Watts	EE Fixt. Watts	Non-Coincident Demand Savings (KW)	Coincident Demand Savings (KW)	On-pk Energy Savings (kWh)	Off-pk Energy Savings (kWh)	IRP PV Benefit ($)	Social PV Benefit ($)	Recommended Incentive*** ($)	Recommended Incentive*** %PV	PV Program Cost ($)	NPV ($)	Incr. Cost** ($)	Cost Savings ($)	Payback wo/ Inc. (yrs)	Payback w/ Inc. (yrs)	Weighting Factor	(%)	BC Ratio
Std T8 to Prem T8	4-foot	4	F32T8	32	109.5	F32T8 / ES	27	85	0.052	0.048	37	39	83	115	62	75%	62	53	61.93	9	7.2	0.0	33%	100%	1.8
		3	F32T8	32	83.5	F32T8 / ES	27	64	0.041	0.038	29	31	66	91	62	95%	62	28	62.05	7	9.2	0.0	33%	100%	1.5
		2	F32T8	32	56.5	F32T8 / ES	27	42	0.029	0.027	21	22	47	65	52	109%	52	14	51.58	5	10.5	0.0	33%	100%	1.3
		1	F32T8	32	30	F32T8 / ES	27	23	0.014	0.013	10	11	23	32	47	202%	47	-15	46.89	2	19.5	0.0	0%	100%	0.7
Weighted Average				32	83		27	64	0.041	0.038	29	31	65	90	59	93%	59	32	58.52	7	9.0	0.0	100%	100%	1.5
Per Lamp	4-foot	4	F32T8	32	27.4	F32T8 / ES	27	21	0.013	0.012	9	10	21	29	15	75%	15	13	15.48	2	7.2	0.0	33%	100%	1.8
		3	F32T8	32	27.8	F32T8 / ES	27	21	0.014	0.013	10	10	22	30	21	95%	21	9	20.68	2	9.2	0.0	33%	100%	1.5
		2	F32T8	32	28.3	F32T8 / ES	27	21	0.015	0.014	10	11	24	33	26	109%	26	7	25.79	2	10.5	0.0	33%	100%	0.7
		1	F32T8	32	30.0	F32T8 / ES	27	23	0.014	0.013	10	11	23	32	47	202%	47	-15	46.89	2	19.5	0.0	0%	100%	0.7
Weighted Average				32	28		27	21	0.014	0.013	10	10	22	30	21	93%	21	10	20.65	2	9.0	0.0	100%	100%	-1.5
Weighted Average Check				OK	OK		OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK

*Measure life based on DEER 2008 EUL data.
** Incremental cost is total cost for a new T8 under the assumption that customers do not buy new T12 fixtures/ lamps
***Incentive based on 2011 UES Program Planning.
Since no installation data available for UNSE territory, adapted this MAS from APS incremental costs to UNSE avoided costs and Standard T8 operating data.
Definition of a Premium T8 as a 28W or 25W 4' lamp is based on the Consortium for Energy Efficiency's definition for Reduced Wattage T8 Systems.
Based on EE Fixture Watts, 4-foot Premium T8s use an average of 78% of the wattage of 4-foot Regular T8s. Assumed that the same is true for 3-foot and 2-foot Premium T8s.

Appendix I

Schools - Existing Motors

Incentive Calculations
VSD's Installed on ODP Motors
1800 RPM

PROGRAM DATA	
Conservation Life (yrs):	15
Program Life (yrs):	5
Demand AC ($/kW):	74.78
Summer On-pk Energy AC ($/kWh):	0.09
Summer Off-pk Energy AC ($/kWh):	0.07
Winter On-pk Energy AC ($/kWh):	0.08
Winter Off-pk Energy AC ($/kWh):	0.07
Program Admin Costs ($/unit):	NA
IRP Discount Rate:	9.02%
Social Discount Rate	4.00%
NTG Ratio:	100%

RATE DATA	
Rate:	
$/kW:	0.00
$/kWh, On-Peak:	0.11
$/kWh, Off-Peak:	0.11

SAVINGS FACTOR ASSUMPTIONS	
VFD Efficiency:	95%
Peak Flow Ratio (Dem	0.95
Avg Flow Ratio (Energ	0.55

OPERATING DATA	
On-Pk Op. Hours:	2440
Off-Pk Op. Hours:	2643
Summer Ratio:	50%
Winter Ratio:	50%
Coincidence Factor:	0.95
Load Factor:	0.68
Demand Savings Factor:	0.0%
Energy Savings Factor:	76.9%

OTHER FACTORS	
Line Loss Factor-Demand:	9.5%
Line Loss Factor-Energy:	9.5%
Capacity Reserve Factor:	0.0%
Application	RET / NEW
Cost Basis:	Full Installed

						INCENTIVE CALCULATIONS						CUSTOMER COST/SAVINGS				WGT.	%Inc.	Societal
Motor HP	Motor Eff.	Non Coin Demand Savings Per HP (KW)	Coin Demand Savings Per HP (kW)	On-pk Savings Per HP (KWh)	Off-pk Savings Per HP (KWh)	IRP PV Benefit ($)	Social PV Benefit ($)	Recommended Incentive (Per HP)* ($)	Recommended Incentive (Per HP)* %PV	PV Cost Per HP ($)	NPV ($)	Incr. Cost Per HP ($)	Cost Savings Per HP ($)	Payback wo/ Inc. (yrs)	Payback w/ Inc. (yrs)	Weighting Factor		BC Ratio
1	80.4%	0.00	0.00	1,188	1,287	1,676	2,744	1,051	62.71%	1,051	625	1,051	281	3.7	0.0	11.7%	100%	2.6
1.5	84.8%	0.00	0.00	1,126	1,220	1,588	2,601	715	45.02%	715	873	715	266	2.7	0.0	11.7%	100%	3.6
2	85.7%	0.00	0.00	1,115	1,207	1,572	2,575	545	34.69%	545	1,027	545	263	2.1	0.0	11.7%	100%	4.7
3	85.7%	0.00	0.00	1,115	1,207	1,572	2,575	374	23.82%	374	1,198	374	263	1.4	0.0	11.7%	100%	6.9
5	85.7%	0.00	0.00	1,115	1,207	1,572	2,575	235	14.95%	235	1,337	235	263	0.9	0.0	11.7%	100%	11.0
7.5	85.7%	0.00	0.00	1,115	1,207	1,572	2,575	164	10.41%	164	1,409	164	263	0.6	0.0	6.6%	100%	15.7
10	85.7%	0.00	0.00	1,115	1,207	1,572	2,575	127	8.10%	127	1,445	127	263	0.5	0.0	6.6%	100%	20.2
15	85.7%	0.00	0.00	1,115	1,207	1,572	2,575	90	5.74%	90	1,482	90	263	0.3	0.0	6.6%	100%	28.6
20	85.7%	0.00	0.00	1,115	1,207	1,572	2,575	71	4.52%	71	1,501	71	263	0.3	0.0	6.6%	100%	36.2
25	85.7%	0.00	0.00	1,115	1,207	1,572	2,575	59	3.77%	59	1,513	59	263	0.2	0.0	2.3%	100%	43.4
30	85.7%	0.00	0.00	1,115	1,207	1,572	2,575	51	3.26%	51	1,521	51	263	0.2	0.0	2.3%	100%	50.2
40	85.7%	0.00	0.00	1,115	1,207	1,572	2,575	41	2.60%	41	1,531	41	263	0.2	0.0	2.3%	100%	62.9
50	85.7%	0.00	0.00	1,115	1,207	1,572	2,575	35	2.20%	35	1,538	35	263	0.1	0.0	2.3%	100%	74.6
60	85.7%	0.00	0.00	1,115	1,207	1,572	2,575	30	1.92%	30	1,542	30	263	0.1	0.0	1.0%	100%	85.5
75	85.7%	0.00	0.00	1,115	1,207	1,572	2,575	26	1.63%	26	1,547	26	263	0.1	0.0	1.0%	100%	100.7
100	85.7%	0.00	0.00	1,115	1,207	1,572	2,575	21	1.33%	21	1,551	21	263	0.1	0.0	1.0%	100%	123.6
125	85.7%	0.00	0.00	1,115	1,207	1,572	2,575	18	1.14%	18	1,554	18	263	0.1	0.0	0.6%	100%	144.0
150	85.7%	0.00	0.00	1,115	1,207	1,572	2,575	16	1.01%	16	1,556	16	263	0.1	0.0	0.6%	100%	162.8
200	85.7%	0.00	0.00	1,115	1,207	1,572	2,575	13	0.83%	13	1,559	13	263	0.0	0.0	0.6%	100%	197.2
300	85.7%	0.00	0.00	1,115	1,207	1,572	2,575	10	0.64%	10	1,562	10	263	0.0	0.0	0.7%	100%	254.8
501-1000	92.3%	0.00	0.00	1,034	1,121	1,459	2,390	10	0.69%	10	1,449	10	244	0.0	0.0	0.2%	100%	236.5
1000+	92.3%	0.00	0.00	1,034	1,121	1,459	2,390	10	0.69%	10	1,449	10	244	0.0	0.0	0.1%	100%	236.5
Weighted Average		0	0	1,121	1,214	1,581	2,589	377	0	377	1,204	377	265	1	0.00	100%	100%	6.9

*Based on 2011 UES Program Planning.

Appendix I

Incentive Calculations

Schools - New Refrigerators

Occupancy Sensor Vending Machine and Reach-in Cooler Controls

PROGRAM DATA	
Measure Life (yrs):	12
Program Life (yrs):	5
Demand AC ($/kW):	68.44
Summer On-pk Energy AC ($/kWh):	0.08
Summer Off-pk Energy AC ($/kWh):	0.06
Winter On-pk Energy AC ($/kWh):	0.08
Winter Off-pk Energy AC ($/kWh):	0.07
Program Admin Costs ($/unit):	NA
Discount Rate:	9.02%
Social Discount Rate:	4.00%
NTG Ratio:	100%

RATE DATA	
Rate:	
$/kW:	0.00
$/kWh, On-Peak:	0.11
$/kWh, Off-Peak:	0.11

OPERATING DATA	
On-Pk Op. Hours Fraction:	24%
Off-Pk Op. Hours Fraction:	76%
Summer Ratio:	50%
Winter Ratio:	50%
Coincidence Factor:	100%
Demand Load Factor**:	0.60

OTHER FACTORS	
Line Loss Factor-Demand:	9.5%
Line Loss Factor-Energy:	9.5%
Capacity Reserve Factor:	0%
Application	RET, NEW
Cost Basis:	Installed

		DEMAND/ENERGY SAVINGS							INCENTIVE CALCULATIONS						CUSTOMER COST/SAVINGS				WGT.	%Incent	Societal
Measure Description	Type	Base Annual kWh	Demand Savings Fraction*	Energy Savings Fraction*	Non-Coin. Demand Savings Per Unit (KW)	Coin. Demand Savings Per Unit (KW)	On-pk Savings Per Unit (KWh)	Off-pk Savings Per Unit (KWh)	IRP PV Benefit Per Unit ($)	Social PV Benefit Per Unit ($)	Recommended Incentive (Per Unit)*** ($)	Recommended Incentive (Per Unit)*** %PV	PV Cost Per Unit ($)	NPV ($)	Incr. Cost Per Unit ($)	Cost Savings Per Unit ($)	Payback wo/ Inc. (yrs)	Payback w/ Inc. (yrs)	Weighting Factor**	(%)	BC Ratio
Reach-in Cooler Controls	CoolerMiser	4,000	15%	30%	0.11	0.11	293	907	702	922	199	28%	199	503	199	136	1.5	0.0	33%	100%	4.6
Beverage Case Controls	VendMiser	3,500	23%	46%	0.15	0.15	393	1,217	942	1,236	199	21%	199	743	199	183	1.1	0.0	33%	100%	6.2
Snack Machine Controls	SnackMiser	700	23%	46%	0.03	0.03	79	243	188	247	103	54%	103	86	103	37	2.8	0.0	33%	100%	2.4
Weighted Average		2,733	20%	41%	0.10	0.10	255	789	611	802	167	35%	167	444	167	118	1.8	0.0	100%	100%	4.8
Weighted Average Check			OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK

*Personal correspondence with USA technologies/ verifiable through "Evaluation of the LiteVend Program" Ecos 2004: http://calmac.org/publications/Final_Report_063004.pdf

**Demand Load Factor and Weighting Factor based on engineering assumptions.

***Incentives based on UES 2011 Program Planning.

Appendix I

Schools - New Plug Loads

Incentive Calculations
Advanced Power Strips

PROGRAM DATA	
Measure Life (yrs)*:	12
Program Life (yrs):	5
Demand AC ($/kW):	68.44
Summer On-pk Energy AC ($/kWh):	0.08
Summer Off-pk Energy AC ($/kWh):	0.06
Winter On-pk Energy AC ($/kWh):	0.08
Winter Off-pk Energy AC ($/kWh):	0.07
Program Admin Costs ($/kWh, saved)	NA
Discount Rate:	9.02%
Social Discount Rate	4.00%
NTG Ratio:	100%

RATE DATA	
Rate:	
$/kW:	0.00
$/kWh, On-Peak:	0.11
$/kWh, Off-Peak:	0.11

OPERATING DATA	
On-Pk Op. Hours:	38%
Off-Pk Op. Hours:	62%
Summer Ratio:	50%
Winter Ratio:	50%
Coincidence Factor:	1.00

OTHER FACTORS	
Line Loss Factor - Demand:	9.5%
Line Loss Factor - Energy:	9.5%
Capacity Reserve Factor:	0%
Application	RET
Cost Basis:	Full Installed

		DEMAND/ ENERGY SAVINGS					INCENTIVE CALCULATIONS							CUSTOMER COST/ SAVINGS				WGT.	%Incent	Societal
Measure Type	Size	# of Smart Strips	Non-Coincident Demand Savings (KW)	Coincident Demand Savings (KW)	On-pk Energy Savings (KWh)	Off-pk Energy Savings (KWh)	IRP PV Benefit ($)	Social PV Benefit ($)	Recommended Incentive** ($)	Recommended Incentive** %PV	Program Admin Costs ($)	PV Total Cost ($)	NPV ($)	Incr. Cost ($)	Cost Savings ($)	Payback wo/ Inc. (yrs)	Payback w/ Inc. (yrs)	Weighting Factor***	(%)	BC Ratio
Occupancy	8-outlet	1	0.044	0.044	65	105	117	154	90	77%	90	180	-26	90	19	4.7	0.0	100%	100%	0.9
	Weighted Average		0.044	0.044	65	105	117	154	90	77%	90	180	-26	90	19	4.7	0.0	100%	100%	0.9
Load Sensor	6-outlet	1	0.023	0.023	36	59	65	85	30	46%	30	60	25	30	11	2.8	0.0	31%	100%	1.4
	7-outlet	1	0.023	0.023	37	61	67	88	32	47%	32	63	25	32	11	2.8	0.0	8%	100%	1.4
	8-outlet	1	0.026	0.026	42	69	75	99	32	42%	32	64	35	32	13	2.5	0.0	31%	100%	1.5
	10-outlet	1	0.034	0.034	57	93	101	133	34	34%	34	68	65	34	17	2.0	0.0	31%	100%	2.0
	Weighted Average		0.027	0.027	45	73	79	104	32	41%	32	64	40	32	13	2.5	0.0	100%	100%	1.6
Timer Plug	8-outlet	1	0.047	0.047	81	132	142	187	19	13%	19	38	149	19	24	0.8	0.0	100%	100%	4.9
	Weighted Average		0.047	0.047	81	132	142	187	19	13%	19	38	149	19	24	0.8	0.0	100%	100%	4.9

*Measure life based on information in *Final Report Electronics and Energy Efficiency: A Plug Load Characterization Study* SCE0284. Prepared for Southern California Edison by Research Into Action. January 29, 2010.

**Incentives based on 2011 UES Program Planning.

***Weighting Factor based on engineering assumptions.